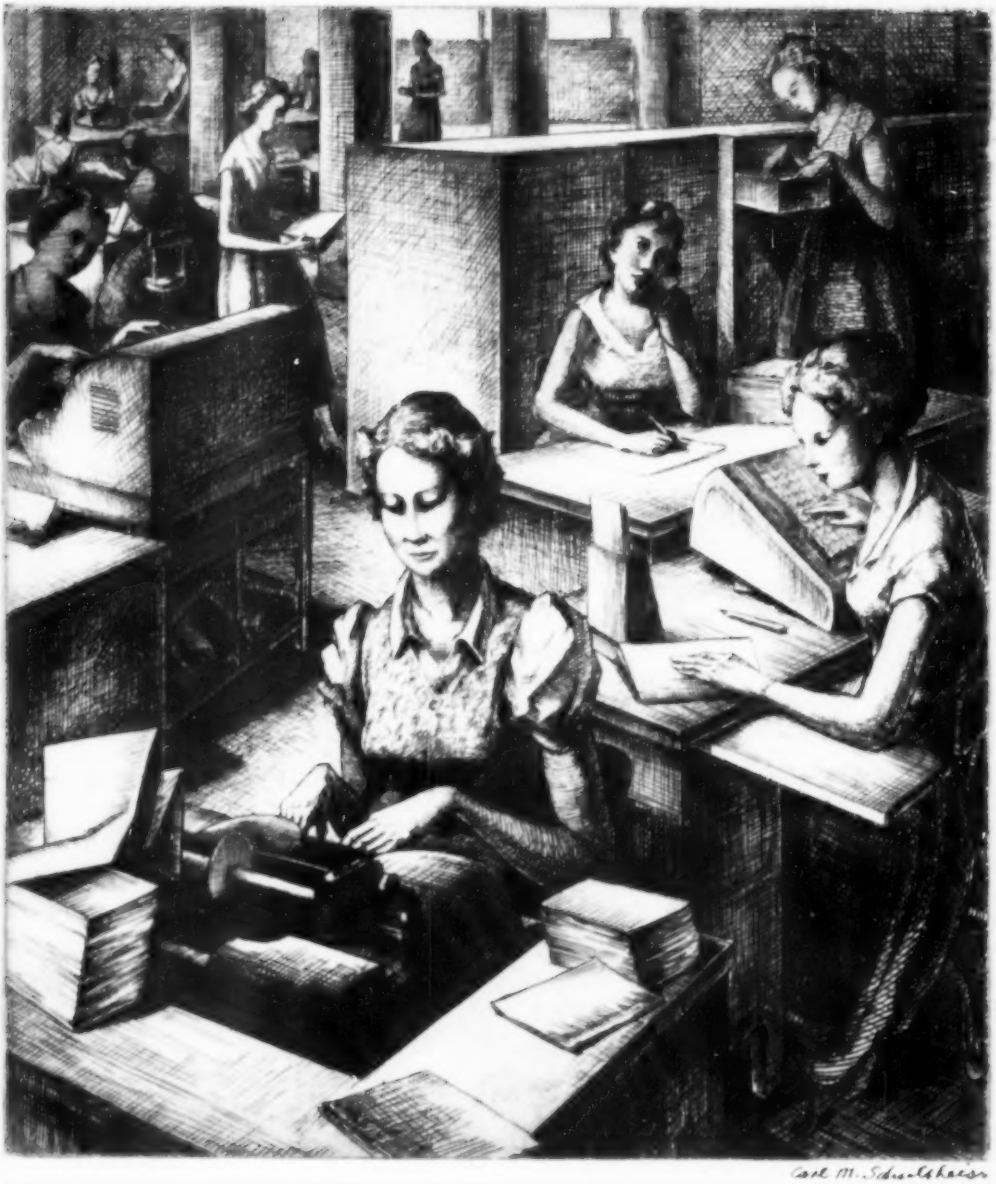
Bell Telephone MAGAZINE

AUTUMN 1954



ACCOUNTING OPERATIONS: People and Diversified Equipment

VOLUME XXXIII
NUMBER THREE
AUTUMN 1954

Bell Telephone Magazine

A non-technical review, published quarterly to give Bell System management people a broader view of the history, objectives, operations, and achievements of this business than they might attain in the course of their day-to-day occupations, and an added sense of participation in the problems and accomplishments of our nation-wide public service.

A MEDIUM OF SUGGESTION and A RECORD OF PROGRESS

Cover: "Accounting Operations: People and Diversified Equipment." From an original etching of Accounting girls at various operations, executed for this MAGAZINE
Carl M. Schultheiss

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JUDSON S. BRADLEY, *Editor*

Published for the Bell System by the Public Relations Department, American Telephone and Telegraph Company, 195 Broadway, New York 7, N. Y.

CLEO F. CRAIG, *President* S. WHITNEY LANDON, *Secretary* JOHN J. SCANLON, *Treasurer*

Who's Who & What's What

IN THIS ISSUE

O. & E. Vice President: Eugene J. McNeely

THE TELEPHONE CAREER of A. T. and T. Vice President EUGENE J. MCNEELY was described in the previous (Summer 1954) issue of this MAGAZINE, which carried his introduction to the important statement on "Emergency Mobilization and the Bell System."

AS OUTSIDE PLANT ENGINEER of A. T. & T. Co., CHARLES G. SINCLAIR, JR., has been well aware of the post-war growth of this country's highways and byways, and much concerned over the effect on telephone construction and reconstruction. Mr. Sinclair joined the Engineering Department of the New York Telephone Company in 1913, became a group head there in 1917, and transferred to A. T. & T. in 1921 as a group head in the Engineering Division of the O. and E. Department. His first responsibility was for underground construction, splicing and testing. Subsequently he was placed in charge of construction, maintenance and tools, and has held his present post since 1948. His most recent previous contribution to this MAGAZINE was "Exchange Cable: The Drama of Post-war Production," in the issue for Summer 1948.

Outside Plant Engineer: Charles G. Sinclair Jr.

Information supervisor: R. S. Callvert

CREATOR of the brochure referred to in and bearing the same title as this article, R. S. CALLVERT has been for more than two years information supervisor in the Public Relations Department of the A. T. & T. Co. After study, newspaper work, and public relations experience on the West Coast, where he was born, Mr. Callvert joined the Bell System in 1941 as publicity representative at the Western Electric Company's Hawthorne Works in Chicago, and subsequently became editor of the employee publication there. In 1946 he moved East to Western's headquarters in New York, where he was appointed publications supervisor. A member of the *publications* group of the A. T. & T. department when he wrote his contribution to this issue, Mr. Callvert transferred to the *employee information* group on October 1.

STARTING AS AN OPERATOR in New Jersey in 1916, MARGARET E. FAWCETT worked up through the lines of organization to be a chief operator. When the New Jersey Bell Telephone Company was organized in 1927 she was appointed to the staff of the general traffic supervisor, while retaining the title of chief operator and working with the chief operators in various New Jersey offices. In 1928 she joined the traffic division of A. T. and T.'s O. and E. Department. Here she has worked on operator training plans, employment problems, and on central office management training. Last year her title was changed to traffic induction and development engineer, and—appropriately enough—her responsibilities now concern more particularly the development of chief operators and assistant chief operators, their induction into the ranks of management, and the induction of new employees into the traffic organization. She has contributed several articles to this MAGAZINE: most recently "Service Executives: The System's Chief Operators" in the Autumn 1952 issue.

Smiling traffic engineer: Margaret E. Fawcett

THE TITLE originally proposed—"Born in Baltimore"—for the article which begins on page 169 applied not only to the system of telephone education there but to the

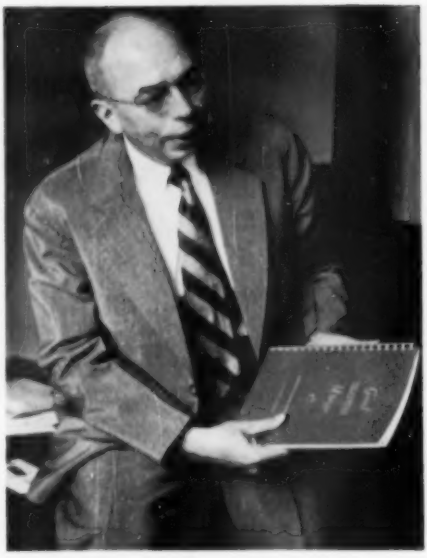
authors, Messrs. E. DUNCAN HYDE and CHAUNCEY R. TATUM, both of whom are natives of that city.

Mr. Hyde joined the Baltimore public school system in 1930 after having worked for a short time as an accountant—accounting having been his college major. He served successively as business teacher, department head, and, for the past ten years, as supervisor of business education. During this period he has also taught evening adult classes in the city schools and teacher-training classes at the University

Educator: E. Duncan Hyde

of Maryland. He has contributed a number of articles to professional magazines and holds membership in various professional societies and associations, including the National Office Management Association, of which he is a director.

Mr. Tatum joined the Commercial Department of the Chesapeake & Potomac Telephone Company of Baltimore City in 1928 after some years' experience in outside financial and accounting work. He has served as business office manager and commercial engineer, and since 1945 has



Customer Relations specialist: Chauncey R. Tatum

specialized in educational and lecture-demonstration activities in the customer relations group in the Commercial Department of the Baltimore Company. As early as 1936 Mr. Tatum was designated a member—and was subsequently chairman—of the guidance advisory committee of Balti-

At the wheel: Frederick K. Glynn

more's Department of Education. He has served as visiting lecturer in commercial communications at the Naval Postgraduate School at Annapolis, has lectured on audio-visual materials at the University of Baltimore, and since 1953 has served as instructor in public relations in McCoy College of Johns Hopkins University.

SERVICE IN THE radio division of the Army Signal Corps led FREDERICK K. GLYNN in 1919 to the Western Electric Company, where he worked on "wireless" equipment for a year. Then he moved to the New York Telephone Company for a term in the construction tools and equipment laboratory. Tools and equipment led toward his long-term objective of working with motor vehicles, and he reached it in 1923, when he became the New York Company's engineer of motor vehicles. Since 1925 he has been automotive engineer in the plant operations division of the O. and E. Department of A. T. & T. Co. The accompanying photograph shows Mr. Glynn at the wheel—but it is the wheel of the Glynn cruiser, aboard which he and Mrs. Glynn live for about six months of the year.

Bell System resources, experience, recuperative strength make possible prompt restoration of service after two vicious hurricanes smite telephone companies

THE NORTHEAST WITHSTANDS SUCCESSIVE BATTERINGS

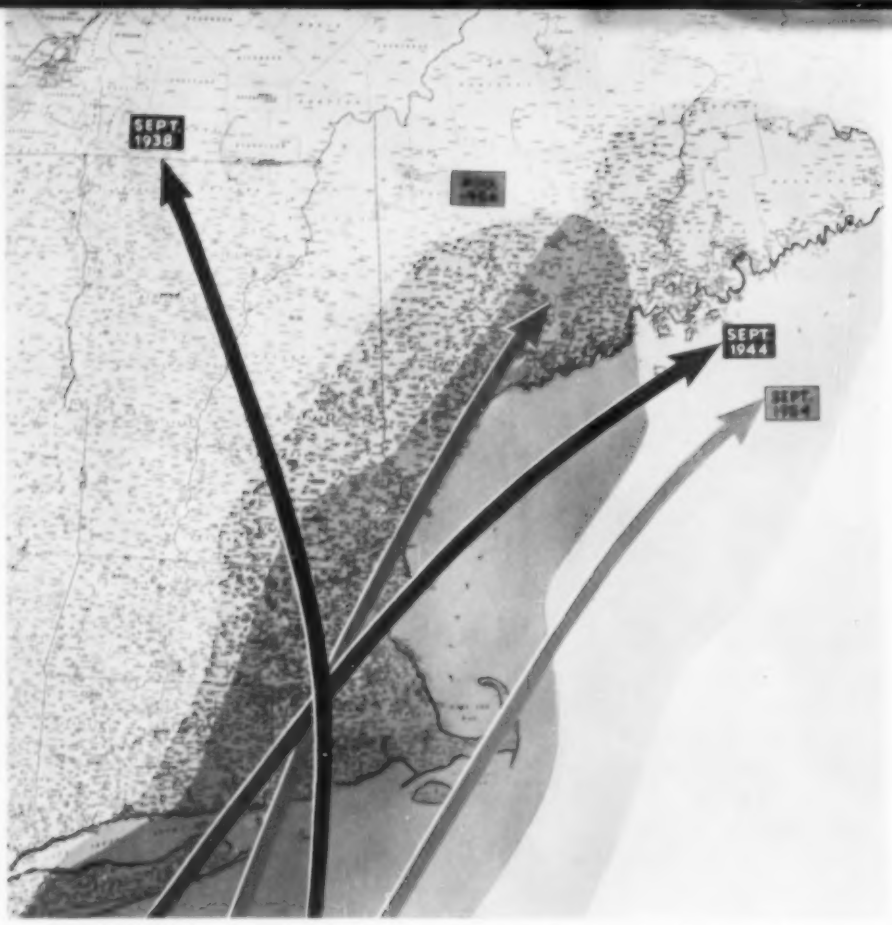
THE HURRICANES which struck the northeastern states successive blows on August 31 and September 11, 1954, combined to put more telephones out of order than did either of the disastrous hurricanes of 1938 and 1944. While the parallel did not hold for all elements of telephone destruction and restoration, the damage caused by the recent storms was hideous, the dollar cost was staggering, and only the resources of the Bell System in men and materials and money and skill made possible the miracle of restoration—which had been completed long before this account appears in type.

Any catastrophe of such proportions, with its train of death and destruction and its aftermath of wreckage and muck and loss, is a grim and heartbreaking business. From the telephone standpoint, this Autumn's blows were particularly disheartening because of their repetitive occurrence. For the 334,000 telephones put out of service on August 31 were well on the way to complete restoration when severe thunderstorms in much of the New England area knocked out over 50,000 more telephones —many of them only just restored to service. And on the heels of this came the September 11 hurricane, whose 295,000 newly "dead" telephones included still others which had only then been restored to usefulness.

THE AUGUST HURRICANE had been spotted in the Caribbean and tracked as it progressed slowly in a generally northeasterly direction. Then, on the last day of the month, its tempo changed. It charged across Long Island—with the back of its hand to New Jersey and New York City—and broke upon New England in the area where Connecticut and Rhode Island adjoin. As it proceeded on across Massachusetts and New Hampshire and swung through Maine's seaward edge, crashing trees and radio towers and church steeples inevitably recalled the tragedy of 1938.

It was principally in the territory of the New England Telephone and Telegraph Company that the damage was heaviest—and New England people are experienced in hurricanes by now. Even as their own 5,000 men brought their skill and equipment to bear on the vast task of clean-up and repair, while Western Electric shipped supplies in a steady flow, the established pattern of disaster relief summoned ready help from beyond New England's borders.

Opposite: Long Lines lineman from Plattsburg, N. Y., runs new wire in Brownfield, Maine, to restore hurricane damage.



Arrows showing the approximate course of the "eyes" of these four hurricanes can convey nothing of their extent or their stupendous power. The shaded portion indicates only the area of devastating force of the two hurricanes of 1954.

Five Bell Companies sent men—pronto: New York, New Jersey, Pennsylvania, and the Chesapeake and Potomac Companies of Baltimore and Washington. They came overland. 1,650 men in a great fleet of 900 vehicles—many driving all night to reach the hard-hit cities and towns widely spread throughout the territory.

They knew what to do, visitors and New Englanders alike, and made rapid progress in the restoration of service. Within three days they had put all isolated central offices back on the map and had breathed life into half and more of the out-of-service telephones. Full restoration was in sight, and about half the visitors had headed home—when the hurricane of September 11 bore down on places and people only just recovering from the previous attack.

This second hurricane was different: bigger, rougher. It had been traced as it roared straight at New York and New England. A. T. & T. in New York City had set up a control center to work with the New England Company's in Boston, and again warned sister companies to stand by for calls for help. Meanwhile, the storm thrashed eastward past the tip of Long Island and along the Atlantic shore, its wind and waves battering the coastal re-

gion till it reached Eastport, Maine, and thence moved on into Canada's Maritime Provinces.

Even before this second blow had been felt in force, more convoys were rolling to the scene. Recruits from New Jersey, Pennsylvania and Long Lines were followed on Sunday and Monday by men from the New York and Southern New England companies, which had by then caught their breath after a fast clean-up of their own troubles. And from Detroit, a 90-car freight train of Michigan Bell trucks and eight sleeping cars of Michigan Bell men rode the rails to New England. For the September hurricane left in its wake nearly 300,000 telephone out of order—as one measure of its destructive force.

THE AUTUMN HURRICANES OF 1954 are things of the past by now. Their challenges were met and overcome, as others have been and still others will be, by the Bell System's skilled and loyal people; by its material resources (Western Electric shipped supplies into the storm area from 87 points in 22 states, for instance); and by the administrative ability which knows how and where to direct these great assets to the most effective ends.

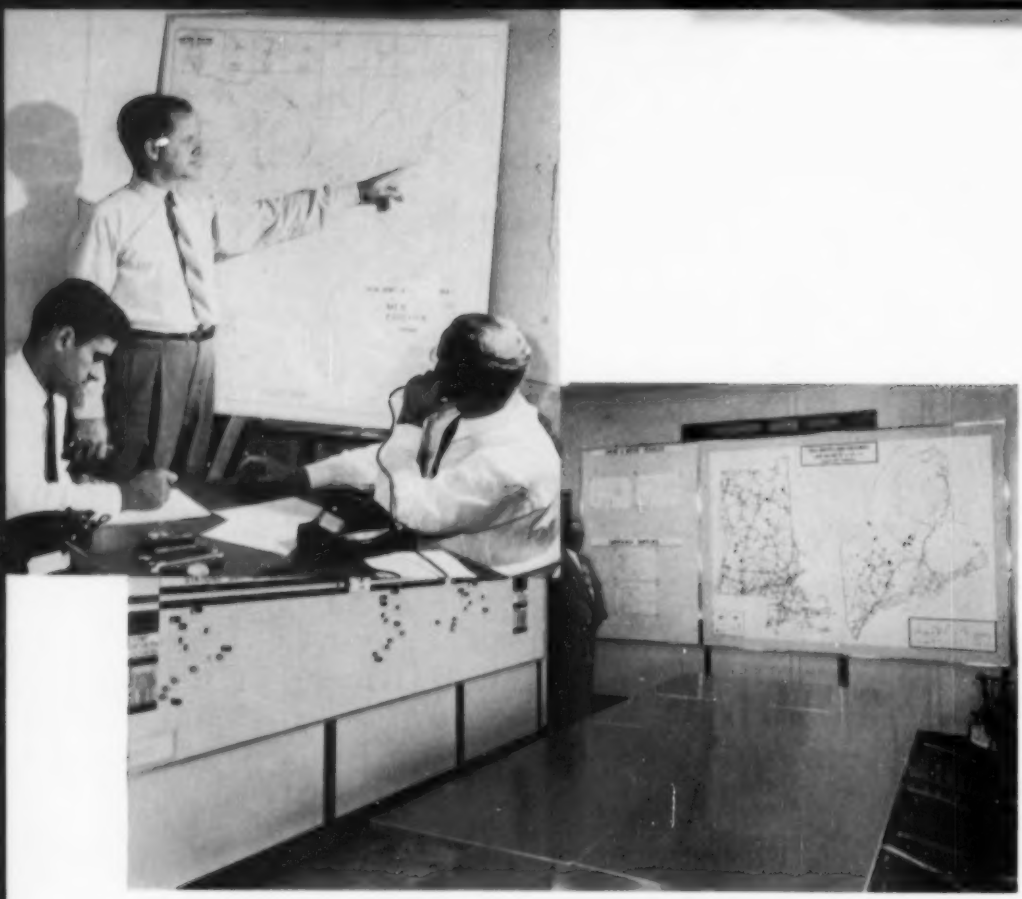
Words can do little to convey the realities of such terrible experiences as have shaken the northeastern part of our country this Fall. They have been effective, however, in conveying many kinds of thanks: of the New England Company for help received; of customers and business people throughout the whole area for prompt and untiring efforts to get their service going again; of newspapers to the telephone companies for valiant steps in behalf of a large segment of the region's population. All these words are supplemented, made vivid and alive, by what the next dozen pages show about the happenings of two dreadful weeks in early Autumn.

New England Hurricanes

	1938	*1944*	*1954*	
	September	*September*	*August*	*September*
Service Interrupted				
Telephones	597,000	414,000	334,000	295,000
Long Distance Circuits	—	1,000+	1,950	2,600
Towns without Long Distance	241	44	140	49
Restoration Forces				
Total Participating	7,900	12,000	11,400	11,500
Borrowed People	2,400	950	1,658	1,947
Borrowed Vehicles	620	350	900	1,100
Estimated Restoration Costs				
Expense (Millions)	$3.7	$3.0	$4.5	$4.1
Capital "	5.8	1.2	1.7	1.4
Total "	$9.5	$4.2	$6.2	$5.5
Restoration Interval—Days	28	12	6	5

Destruction of homes and of telephone facilities was heartbreaking.

The hurricanes vented their fury in cities, in rural communities, and perhaps most violently in coastal areas.



Control centers in New York and Boston kept score, reported the extent of damage, and sent out the calls for help to sister companies.

Men about to take off for New England are briefed on the challenge and the problems they will meet there.

They load personal belongings aboard fully equipped trucks for the long trek to the scene of need.

Trucks form into convoys, complete with supervisors and automotive specialists, to highball over the highways to east and north.

From Michigan a go-car train of trucks and eight cars of men head eastward.

A spirit of helpful comradery pervades the groups which go to the aid of fellow telephone workers.

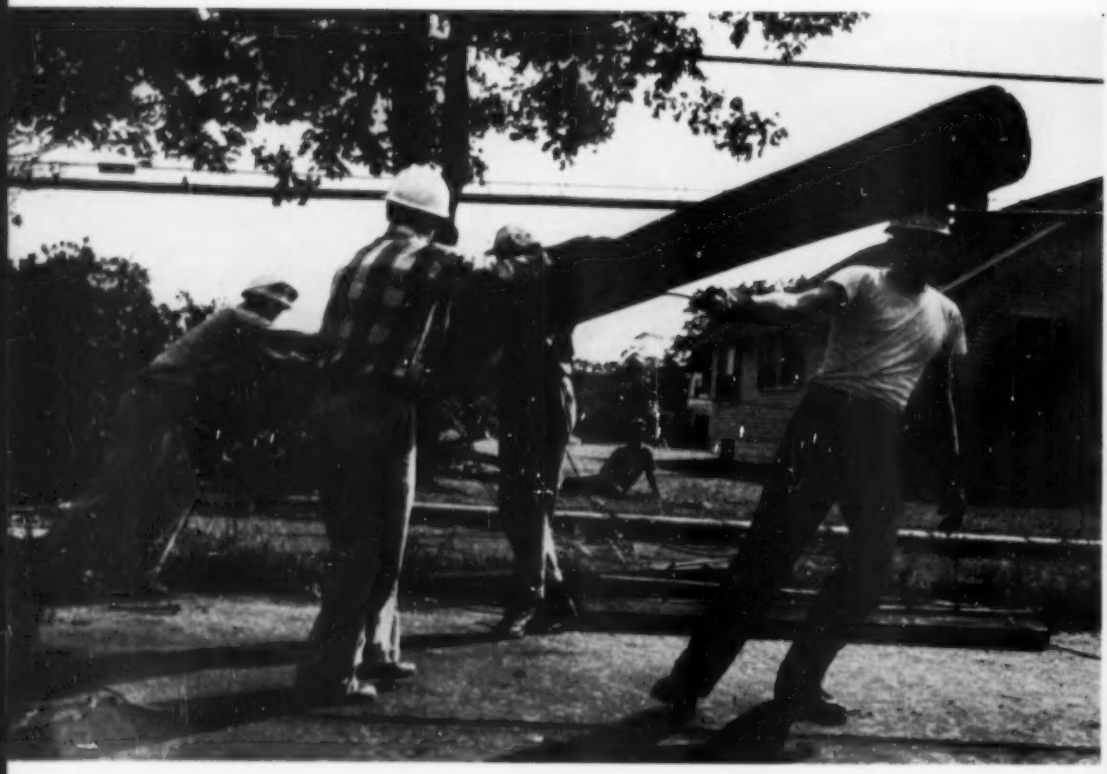
Night and day they roll, stopping only for supplies for men and machines and for the tolls which permit them to move on the quickest routes.

AFETY INSTRUCTION CAR

Left: Telephone men face many a discouraging situation with skill and determination. Full realization of the grave importance of safe operation rides on every truck and with every crew.

Right and below: Labor-aiding equipment played its constructive part in the speedy and efficient replacement of needed items

Often-times there is no substitute for knowledge, skill, and physical strength.

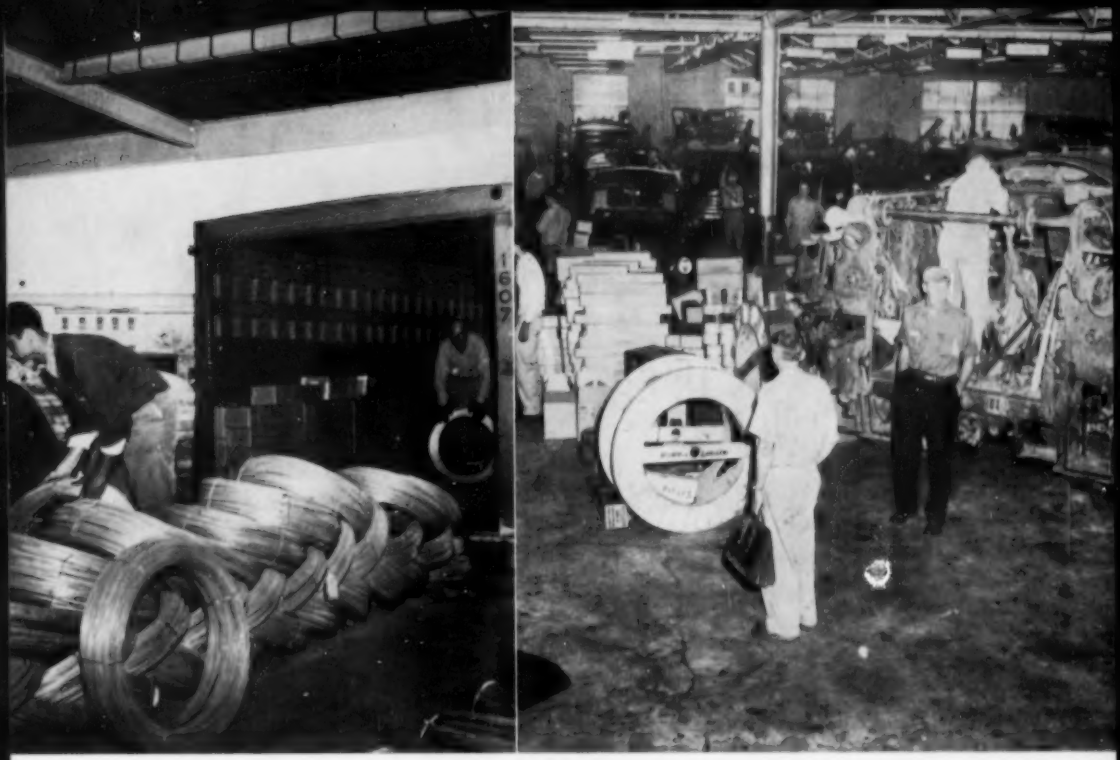


Since falling trees and tree limbs cause the greatest amount of damage, most of the restoration calls for aerial operations.

Work goes on while daylight lasts.

An emergency generator supplies power to a hard-hit Long Lines operating building.

A "telebus" which was moved from place to place makes service available to people whose own service cannot be used.



Supplies were never lacking to implement the manpower which is everywhere at hand to do promptly what needs to be done.

Coöperation is the key to the successful overcoming of one more critical situation which the Bell System faced—and licked.

An editorial

SELLING OUR CUSTOMERS EVERYTHING THEY NEED

EUGENE J. McNEELY

Vice President, OPERATION AND ENGINEERING, A. T. & T. CO.

BELL SYSTEM TELEPHONES have doubled in the last ten years.

Long distance messages have more than doubled.

We have had tremendous expansion—but our customers' needs and demands have been even greater.

While we did our best to meet their wishes, we were forced in many instances to ask them to get along with far less than their real needs.

By the end of 1954 we shall be catching up with the expressed demand in most parts of the country.

We shall generally have sufficient central office facilities to care for new customers without delay.

The station gain will have dropped from a going rate of over two million a year to about a million and a half.

In 1955 the Western Electric Company will be able to furnish three and a half million telephone sets, hundreds of thousands in color, and more cable than ever before.

All those facts show that we are now generally in a position to look for opportunities to provide more complete and convenient service to our customers.

It goes without saying that adequate plant to care for all needs does not appear every place at once. While in the over-all we now have adequate central office facilities, there are some offices that are now nearing complete fill. And while our average cable fill is 75 per cent, there are many cables at present containing no spare pairs.

Before starting a merchandising program after a long period of plant shortages it is necessary, therefore, to determine the adequacy of facilities available in a particular office or locality when more lines or higher grades of service are to be sold. It is also good business judgment to utilize spare plant to provide more complete customer service.

We have more than 400 types of service and kinds of equipment available for subscriber use. However, in a business such as ours the success of a merchandising program is not in trying to sell pieces of equipment, but rather in knowing just what the customer needs and then selling it to him.

Our opportunities for observing the subscriber's needs and selling him what he should have are indeed great. Business office people, either by phone or in person, have about 100,000,000 contacts with our

Telephones and equipment on display.

customers each year. This represents on the average three to four contacts per customer per year. Plant installers and repairmen on the average visit our customers once every year and a half. Sales and servicing representatives visit our large customers many times each year, and our directory salesmen visit them once a year.

While there are many fields into which our merchandising efforts could be directed, there are several that undoubtedly will prove of the greatest value to the customer, and at the same time are indicated by good business judgment. The following are some of the major fields which are ripe for the sales efforts of all of us:

Long distance service. It is one of the best bargains that money can buy. We now have ample facilities to handle more traffic in nearly all parts of the country.

Residence extensions. In most places they cost less than a nickel a day. Where else can so much convenience be obtained for so little? They can also be installed in two-tone or full color to match the decorations of the room. At present only one residence out of eight in the United States has an extension, and on connect orders only one out of eighteen has an extension installed at the time the main telephone is connected. There is plenty of opportunity to sell in this field.

Higher grade of service. With telephone rates as low as they are, most families can afford to have individual lines. During the war and post-war expansion, the per cent individual residence lines dropped to 23 per cent of the total. They have come steadily upward until at the end of 1952 they were 29 per cent of the total, at the end of 1953, 32 per cent, and at the end of 1954 will be over 36 per cent—about equal to the previous high level reached in 1940. As we show the customers the advantages and reasonable price of individual lines, it would seem likely that this per cent could go far beyond the previous high level.

Saving disconnects. Experience indicates that disconnects saved have on the average as long a life as new connects. Where there are spare facilities, this activity is particularly attractive as it not only increases revenues but saves substantial expense.

More families with service. It is expected that in the years immediately ahead, the

number of households in Bell territory will increase about 650,000 per year. This offers a tremendous new market for telephone service. In addition, approximately 10 million of the existing households in the Bell territory have no telephones—about 27 per cent. The Michigan Bell Telephone Company recently canvassed all non-users in a well developed community of about 6,000 households, and when the canvass was completed only 240 households, or 4 per cent, were without telephone service. Unquestionably, there is great opportunity to increase telephone service.

More lines per family. In a great many homes, more than one telephone line is needed. While the percentage of car-owning families having two or more cars is 12 per cent the number having two telephone lines is very small indeed.

Private line and right-of-way services. Many businesses find need for special types of communication services, and in this field we are making real progress in developing private line and right-of-way services.

Miscellaneous services. There are, of course, many auxiliary equipment items that will make the customer's telephone service more complete and satisfactory. Just a few of these are:—pick-up and hold keys, cut-off keys, loud ringing and extension bells, automatic answering devices, shoulder rests, and there are many, many others.

In addition to these various activities, which are particularly timely now, we have of course been active in the broad field of selling to our business customers switchboards, trunks, stations and other auxiliary equipment. These customers likewise are interested in improved representation in the "yellow pages" of the classified directories through effective copy and display space. This field of selling has been growing at a rapid pace during the last five or six years.

Now that our period of shortages is nearing an end, we have before us a great opportunity to sell to our customers the type and quantity of telephone service that they really need, and at the same time more fully utilize telephone plant and make a real contribution to our revenues.

Extensive moving, relocating, rebuilding of lines to meet road-builders' changes without interrupting service imposes burdens on telephone companies

HIGHWAY CONSTRUCTION AND TELEPHONE RECONSTRUCTION

CHARLES G. SINCLAIR JR.

Outside Plant Engineer, A. T. & T. CO.

EACH YEAR millions of Americans driving to and from vacation lands or between cities on ordinary business or social trips find new and inviting highways beckoning. Many are wide four-lane arteries which rapidly are making obsolete the narrow two-lane thoroughfares built before the days of high-speed transportation.

Despite a stepped-up highway construction program throughout the nation in recent years, the job apparently has just begun. At a conference of the State Governors at Bolton Landing, New York, this summer, Vice President Nixon delivered a message from President Eisenhower recommending a greatly increased highway construction program. The message included this statement:

"To start to meet this problem at this session of the Congress, we have increased by approximately 500 million dollars the Federal monies available to the States for road development. This seems like a very substantial sum. But the experts say that five billion dollars a year for ten years, in addition to all current, normal expenditures, will pay off in economic growth; and when we have spent 50 billion dollars in the next ten years, we shall only have made a good start on the highways the country will need for a population of 200 million people. A 50 billion dollar highway program in ten years is a goal toward which we can—and we should—look."

Mr. Nixon's reference to the increase in Federal money made available to the States was directed toward the provisions of the Federal-aid Highway Act of 1954 passed by Congress. It authorizes a total of $1,932,000,000 for the two fiscal years 1956 and 1957—the largest two-year sum ever provided for Federal Highway programs. The President's proposal, of course, would involve a tremendous additional boost in highway building activity.

Regardless of whether a program of such magnitude is undertaken, it is clear that the already overcrowded highways cannot accommodate the millions of cars that continue to roll off assembly lines. The number of motor vehicles increased from 35 million in 1941 to 56 million in 1953. The prediction for 1960 is 65 million. So it is reasonable to assume that more and more highway construction will be needed.

Construction of an elevated expressway across Boston required the relocation of more than a mile of heavy conduit carrying many large telephone cables (below) and the installation of submarine cables (above) to replace those which had to be abandoned for the same reason.

The telephone industry and other utilities, both privately and publicly owned, have a very vital interest in highway construction programs—aside from sharing with individual citizens the desire to have an adequate road system. Highway changes have resulted in substantial expense to utilities in recent years for relocation of facilities, and it is obvious that such costs are being increased substantially. Before the age of super-highways, improvement of roads involved disturbances of facilities which were in many instances minor in comparison to the relocations now encountered and those certain to be required in the future. Modern express highways, with multi-lane and divided pavements, landscaped shoulders, clover-leaf construction, and graded separations at intersections, widen the areas where utility facilities are likely to be located, thereby forcing their relocation. Actually, the effect of such relocation costs is of direct concern to utility users because the utilities have only one principal source of revenue to meet expenses—the customers who use the services.

LOCATION OF utility plant along highways or near them results from legislative enactments and municipal ordinances over the years encouraging utilities to make use of public highways in order to bring economical service to the greatest number of people. Any other policy, requiring acquisition of private rights of way for utility facilities, would have increased the cost of service to the users. Highways are the arteries of modern civilization—they do not serve exclusively to accommodate vehicular travel but also serve as a means of providing other services which promote the public welfare. In many areas it would be impossible to provide essential services to the public without using public thoroughfares.

(Railroads are the only utility to be reimbursed from Federal funds for costs resulting from highway changes for the relocation of railroad facilities involved in Federal-aid grade-crossing projects. This relief is given despite state statutes which require railroads to pay at least part of the cost of removing hazards at grade crossings. Historically, this Federal assistance began during the 1930's, when many Public Works programs included projects to eliminate grade-crossing hazards.)

During the sessions of the 83rd Congress just concluded, more than a score of witnesses, representing practically every type of publicly and privately owned utility as well as the National Association of Railroad and Utilities Commissioners (which regulates all utilities at the State level), presented before the House and Senate Committees testimony bearing on the problem. Illustrations were cited to show that the effect of relocation expense on individual companies was exceedingly burdensome in many instances and that such costs properly should be considered as part of the highway construction expense. Evidence introduced was based on a study of relocation costs in twelve representative states. In the Highway Act just passed, Congress directed the Secretary of Commerce to make a more complete study, covering all forty-eight states. The Secretary, in turn, directed the Bureau of Public Roads to make this study, and all of the utilities are cooperating.

AN EXAMPLE of a relocation expense encountered by a telephone company is a recent case in Boston. An elevated expressway was constructed across the city to relieve traffic congestion in the center of

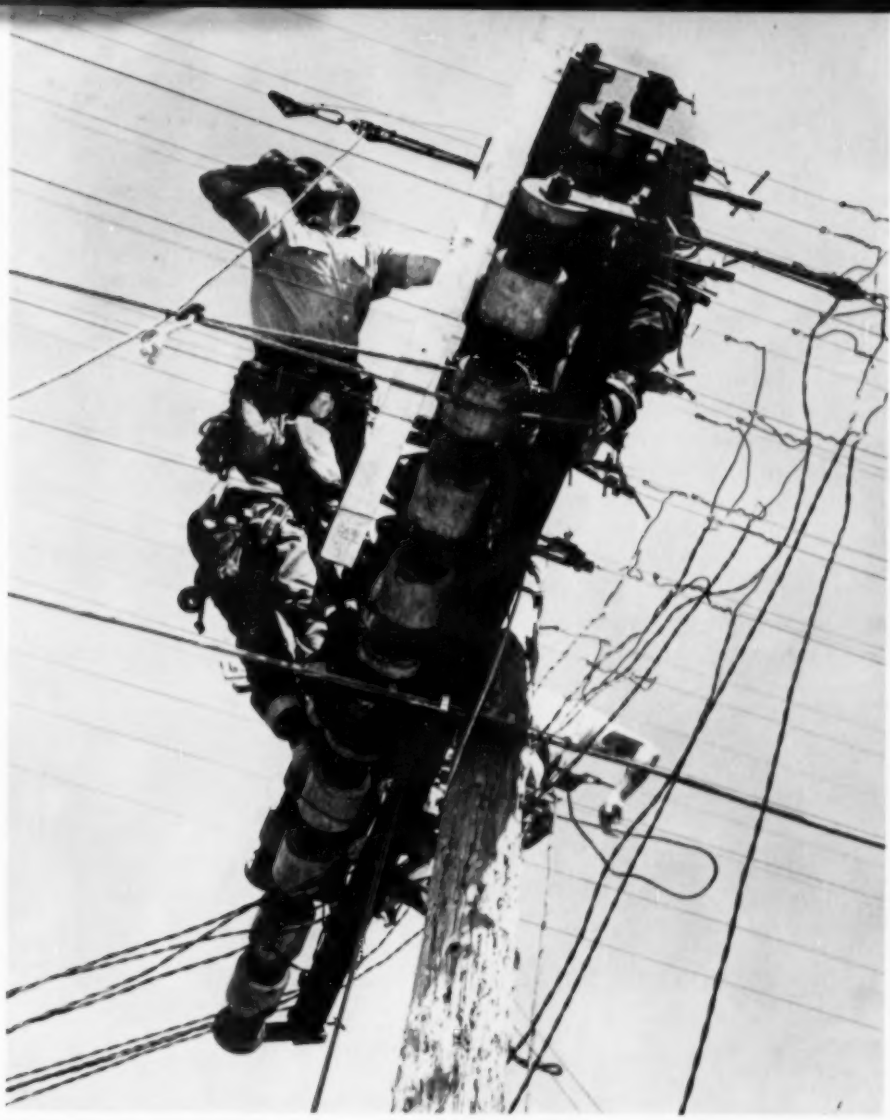
Boston. This involved the relocation of a mile and a quarter of heavy conduit carrying many large telephone cables. It was also necessary to relocate a submarine crossing of the Charles River, which required the installation of new submarine cables at another location to replace those which had to be abandoned because of the highway construction. The outlay occasioned by this project represented an expense to the telephone company of almost one million dollars.

Another job, in Richmond, Va., involved the widening and regrading of a section of the Petersburg Pike, approximately three miles long. All work was within the city and there was no reimbursement of the telephone company. The costs involved amounted to over a quarter of a million dollars.

Practically every utility can cite similar cases, and in every instance the relocation of facilities must be carried on in conjunction with the highway construction program, but the utility services must be furnished without interruption if at all possible. This frequently calls for considerable ingenuity on the part of the utility engineers, as the problems encountered are many and varied.

One case involved lowering by several feet the grade of a highway in which the local telephone company had a heavy conduit run containing a large number of working cables. The five-hundred-foot sections between adjacent manholes

Sometimes telephone pole lines can be moved a few feet by standard telephone company construction equipment.



Reels of wire inserted at one end of each line wire to be shifted provide additional length of wire which permits longer moves.

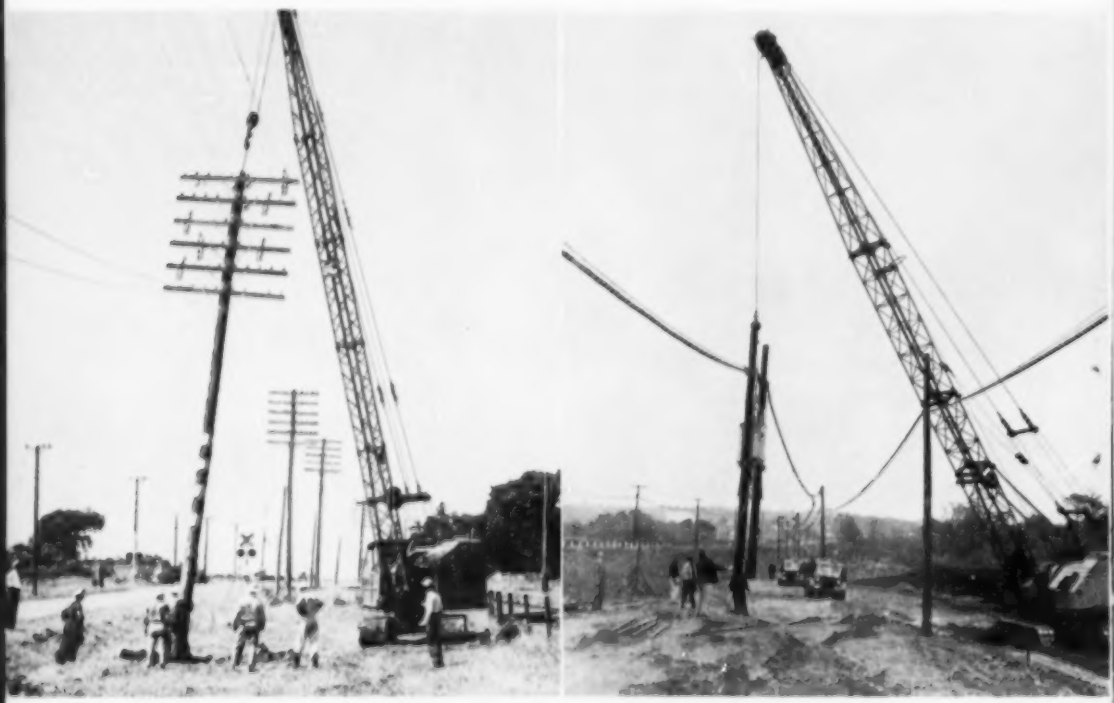
weighed sixty tons apiece, and it was necessary to lower each such section gradually, as a unit. The problem was solved by excavating alongside the conduit to a depth below its base and then excavating under the conduit at intervals, placing large cakes of ice to support the structure. The earth between ice cakes was then removed and the conduit structure allowed to settle as the ice melted under it. By repeating this procedure several times, the conduit was lowered to the desired grade.

Frequently a pole line must be shifted further to one side of a highway that is to be widened. The method used to accomplish the relocation of the poles depends upon a number of factors. If the poles are not too large, the normal telephone construction trucks equipped with special gear, known as a pole moving frame, can

handle the job. This gear raises the pole out of the ground and, while still supporting it and the wires carried on it, the truck moves forward or backward to the new location, where a truck-mounted earth auger has dug a hole to receive it. By moving adjacent poles successively in this manner, the desired shift of the line is effected. Of course, the distance the individual pole can be shifted at one time is limited by the pull of the line wires, but ordinarily a shift of eight to ten feet is feasible. Where the line must be moved a greater distance than this, the operation is usually done in stages until the required relocation is obtained. In using this method, the line wires are not cut, so that the only precaution that must be observed to prevent interference with the continuity of service is to avoid contacts between swinging wires.

An ingenious variant of this method recently enabled a pole line to be shifted a considerable distance from its original location in a one-stage operation. This was accomplished by inserting a reel of wire in each line wire at one end of the section to be shifted. As the poles were moved, the reels of wire were unwound slowly, thus providing the additional length of wire required for the new location of the line.

When the poles are too large, or carry too heavy a load of wires or cables, to be handled by the gear on the normal con-



Powerful cranes are sometimes called on to move pole lines with many cross-arms or heavy cables.

Widening this causeway from two lanes to four made it necessary to move and re-bury in the center parkway the telephone cables which had lain under the fill at the right.

struction trucks, heavy drag-line cranes with booms up to seventy-five feet long are used. These mobile cranes, mounted on caterpillar tracks, are capable of handling heavy open wire lines, cables or even fixtures supporting loading coil cases weighing tons.

A somewhat less spectacular but far more expensive operation is involved when underground utility structures must be rerouted. In such cases there is usually no alternative to abandoning the existing conduit and cable and building anew at another location. An example of this occurred recently when the two-lane highway over the eight-mile causeway carrying traffic from the east and northeast across Mobile Bay into the city of Mobile, Ala., was reconstructed to provide four lanes. Two long distance telephone cables had previously been buried in the fill of the causeway at some distance from the original two-lane pavement. The two additional lanes were provided by constructing a pavement over the location of the cables which were thus made inaccessible. The solution required their replacement with new cables installed in a trench in the center space between the two pavements.

One might cite instance after instance of the application of interesting and ingenious methods of relocating utility structures required by highway construction—for literally hundreds of them arise each year. As already pointed out, it seems altogether likely that the number will increase sharply in the future as the nation comes to grips with the problem of providing an adequate and integrated highway system. The financial implications as they affect the utilities—and the customers of the utilities—are serious.

THE STUDY OF relocation costs now under way in all forty-eight states is to be completed in time for the Secretary of Commerce to collate facts and prepare a report for Congress by February 1, 1955. Reimbursement for relocation expenses incurred by utilities would eliminate a source of "double taxation" upon the utility rate payers. As it is, they now participate in the expense of building the road by paying their fair share of taxes for highway construction and, under the present arrangement, make a second payment in the rates which must include the utility companies' relocation costs. As utility users, their service is not improved as a result of the highway changes and they receive no special benefit not available to all other members of the traveling public using the highways.

As is often the case where two wire-using utilities operate within the same territory, each of the Bell companies has reciprocal agreements with the Western Union Telegraph Company under which one company may lease circuits from the other. These agreements are based on the premise that, in given situations, economies result from the joint use of plant, and, where this is so, it is in the public interest to arrange for such sharing.

The earliest formal contracts of this nature with the telegraph company were entered into in 1928, two separate contracts being established: one for the leasing of facilities wholly within the same city, the second covering the leasing of circuits between cities. The contracts were completely revised in 1946, in particular the scope of Contract No. 2 being considerably broadened as respects the types of circuits leased. This led to a marked increase in the lease of intercity circuits by Western Union from the telephone companies. As of the end of 1953, Western Union derived over two million miles of telegraph channels from the circuits leased from the telephone companies—constituting over sixty per cent of Western Union's miles of domestic telegraph channels.

For the first time since 1946, the No. 2 contracts have now been amended, effective generally May 1, 1954. The recent amendment makes the leasing arrangements somewhat more attractive than formerly, both as to level of charges applicable and by facilitating the lease of intercity circuits for telegraph purposes at the shorter hauls.

Installations in about 100 model homes throughout the country display the variety and utility of our equipment and services to prospective home owners

TELEPHONE CONVENIENCES IN YOUR NEW HOME

R. S. CALLVERT

Information Supervisor, PUBLIC RELATIONS DEPARTMENT, A. T. & T. CO.

NO ONE has calculated how many week-end drivers follow those familiar signs along American roadsides that point the way to that commonplace of our civilization, the model home. For whatever it is worth, a big round statistic turned up in late summer when about 1,000,000 people —more or less—visited a group of "well-telephoned" model homes sponsored by *Better Homes and Gardens* magazine.

There were about 100 of these homes, in 37 states. Each was advertised as "The Home for All America," and each had been constructed by a local builder after a basic

This telephone was installed in living room of model home, but arrangement of house also required extension telephones.

Yellow telephone, one of new line of eight different colors and four two-tone combinations, blended attractively with decoration in master bedroom of model home.

plan conceived by *Better Homes and Gardens* and R. A. Little and Associates, Cleveland architects. The Bell System's connection with this project amounted to what publicity men are wont to call a "tie-in": a promotional activity in which two or more parties share benefits. The magazine wanted to show the public new trends in home construction and decoration; telephone people wanted to show the public the many telephone services available to the householder. So what was more natural than for magazine and telephone companies to get together and present their wares in the same show-cases?

The plan of "The Home for All America" is that of a low-roofed, ranch-type house with living room, dining area, kitchen and utility room, three bedrooms, two baths, an upstairs guest-activity-TV room, a downstairs recreation room, and a workshop. Outside are spacious play areas called "patios" in the West; Easterners call them "terraces." Price: about $30,000.

Here the telephone companies installed equipment representative of our "line" of residential services. Some companies placed descriptive cards or price tags on the various items installed. Most of the companies participating in the project availed themselves of an eight-page full-color booklet entitled "Telephone Conveniences in Your New Home" which had been prepared especially for distribution to people who visited the homes. About 375,000 copies of the brochure, bearing local telephone company imprints, were issued.

Among telephone conveniences advertised in the brochure were extensions,

colored sets, including the new ivory wall set designed particularly for kitchens, outlets for portable telephones in both indoor and outdoor locations, the new light-up dial telephone, the new volume control set for those with impaired hearing, the new automatic answering and recording set. The last-named was included in the brochure because it should appeal to professional men—doctors, for example—or to the busy housewife who, typically these days, has no servant to answer the telephone when she is out.

In each "Home for All America," local department stores had decorated and furnished the rooms. Several telephone companies saw this as a chance to show how our new colored telephones enhance the interior decoration schemes that are currently popular. Full color photographs in the brochure, some of which are reproduced here, also displayed the new line of colored sets. In deciding to advertise colored sets in the model homes, telephone people were convinced they would help sell other telephone items that were immediately available almost everywhere in the country.

Encouraging sales of one of our best bargains, the extension telephone, was a

New ivory wall telephone is proving popular in kitchens. In large kitchen, ideal installation will permit the housewife to sit down while telephoning.

Gaily colored extension telephone fits recreation mood in this downstairs playroom. Model home also has other indoor and outdoor play areas where extensions were needed.

main objective in the "Home for All America" promotion. Curiously enough, although modern architecture stresses "compactness" and "functional" design, the nature of the typical modern house actually brightens the prospects for extension sales. "The Home for All America" is relatively small, yet it tends to spread. It brings the outdoors "in" and the indoors "out." Besides living room and kitchen, the house has several distinctly separate areas of concentrated family activity. Telephone engineers who looked over the plan of the house agreeably conceded that, as in older or traditional types of homes, there was no ideal central place to install a telephone. The new house required—it literally cried out for—extensions.

The advantage of planned telephone facilities, in either remodeled or new homes, was another strong sales point in the "Home for All America" project. The essence of the planned facilities appeal is that the customer's service requirements may grow as his family grows, as he makes additions to his house. And so the customer should ask his architect or builder to work with the telephone company in providing "built-in" telephone conveniences—like the electrical outlets installed for household appliances. It's an old appeal—but a sound one.

Continued experience may demonstrate that model homes, in general, are ideal show cases in which to sell tailor-made telephone services. Logic says they ought to be. Their prevalence on the American scene is too good an opportunity for sales-minded telephone people to overlook.

Certainly the appearance of our communications line in a home bearing an "Open" sign should help familiarize the public with some of the 400 items we have to offer. Then, as they search the suburbs for their "dream house," maybe the week-end driver and his wife will always include us in their dreams. It all sounds very probable. And profitable.

Delegation, planning, training, bring about improvements in service, personnel, and cost aspects of the organization through which the Traffic Department serves customers

A PROGRAM FOR CENTRAL OFFICE ADMINISTRATION

MARGARET E. FAWCETT

Traffic Induction and Development Engineer, A. T. & T. CO.

"WITH BETTER MANAGEMENT of time, there is more of it available."

That observation is one of the findings of the central office administration program which is now being extended throughout the Bell System. Its fundamental soundness suggests some of the reasons for both the importance and the success of that program—and, incidentally, why its principles are of interest beyond the bounds of the Traffic organization where it was originated.

What is it, then: this program which occupies the attention of so many Traffic people—and fathers such an aphorism as a by-product?

It is, briefly, a means to help chief operators to discharge their central office responsibilities more effectively. In the process, it helps other management people in the central offices to do likewise. And so, inevitably, it helps the customers to get better service.

Generalities? Yes.

But one district traffic superintendent said "Good service results are obtained more consistently and with greater ease." A chief operator reported that "The work gets done smoothly and pleasantly and as a result we are all getting greater satisfaction out of our jobs." An assistant chief operator declared that "We are accomplishing more work and we are having more fun."

Those are generalities too. But the feelings they express come from the successful application of the central office administration program both in its basic principles and in its details.

Chief Operators Hold the Key

THE PROGRAM STARTS with the chief operator, so let us begin with her too: the C. O. and the two kinds of knowledge she uses and needs to have.

The first is the technical side of it. And since she started as an operator and came up through the ranks, step by step, that knowledge—or skill, if you will—can be taken pretty much for granted. Cords and keys, dialing or key pulsing, split tricks—all the technicalities of the service or-

The chief operator must have opportunity for creative thinking—for planning and co-ordinating all phases of her job.

ganization of which she is the executive officer are within her experience.

She has other responsibilities, too—non-technical ones. But the chances are that the knowledge and skill to handle them are not as great as her technical expertness—and why would they be? How do you absorb the technique of delegating duties and authority to others? Just when do you learn how to organize a job so that it gets done? Where do you acquire the ability to get along well with people—all sorts of people?

Such leadership qualifications are less tangible than the technical skills of the job and probably a good deal harder to absorb in incidental ways. Yet they are highly important. For only through well-rounded knowledge that includes technical and non-technical skills alike will the chief operator be able to show results in the quality of service, the spirit of her people, and the cost aspects of the job she is doing in the central office where she has charge.

Then what if these important non-technical skills are less well developed; if chief operators lack full confidence in their capabilities in these fields; if they voice a need for help and further development?

Then training must be given in these skills, and sufficient time must be allowed for the chief operators to become expert and confident in them.

Time is the essential element. Chief operators, like other telephone management people, have been selected carefully for their natural qualities and capacities, and the non-technical skills are certainly within the scope of their capabilities—provided they have the time to acquire them.

Administering a Central Office

A CENTRAL OFFICE is a very busy place.

Administrative-wise, a chief operator usually has several assistant chief operators reporting to her, the number depending on the size and complexities of the office. One of the assistants may be the evening chief and another the night chief. Each assistant is concerned with a number of service assistants—who are also known as supervisors in some companies. And each of these, in turn, deals directly with a group of operators at the switchboard.

The roster of central office personnel is rounded out with traffic clerks.

It is through this organization that the chief operator renders service to the customer, and the quality of that service is constantly on her mind. The whole force must be alert and attentive, for every call is important. The message must go through *now*. These are present responsibilities. At the same time, there is a need to build for the future: the appraisal and selection of operators for promotions—the development of each employee to the best she is capable of—helping new operators to adjust to their environment—keeping all employees well informed about the business, —the training of assistants—all these are no less important.

And always there are the unusual occurrences: storm delays, for instance; new methods or practices to be studied and adopted; requests for information or records; conferences, planned for or unexpected.

This little excursion into the activities in a central office should leave no doubt that the chief operator is a busy woman indeed. And that returns us to her need for additional training in non-technical knowledge and skills.

All of which brings us back to the first sentence of this article—and the first scheduled step in the System-wide program we are discussing.

Analyses and What They Show

SINCE THE OBJECTIVE is greater effectiveness on the part of the chief operator and her assistants, the logical beginning-place is an analysis of what each does now—and how much time it takes.

The analysis is kept as simple as possible. Each management employee lists her activities and maintains the record over a period of several weeks.

An assistant chief operator and her service assistants discuss a program for improving service.

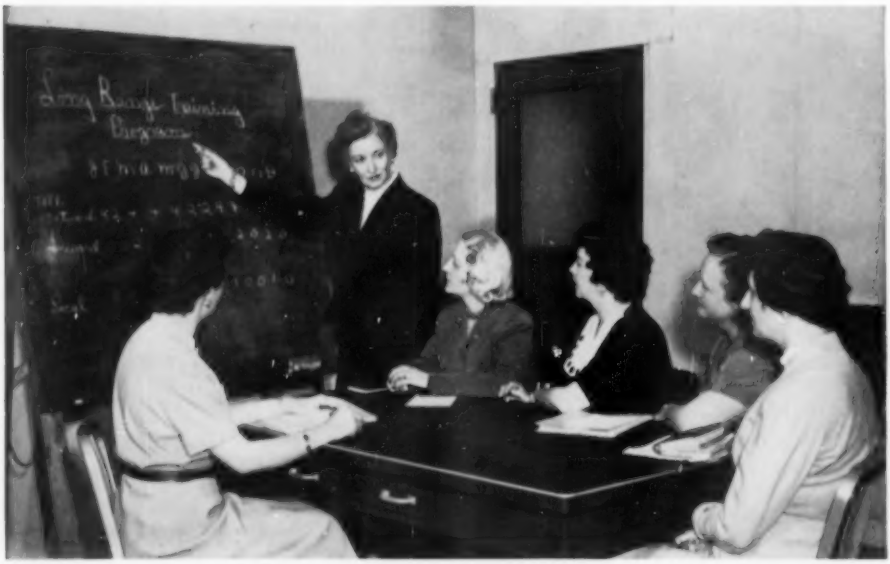
An assistant chief operator and a service assistant at the organization chart which lists the names of the operators assigned to them.

When the analysis is completed, the chief operator studies it and she then prepares a composite record of her own activities and those of her assistants. And where the latter have made comments about the time-consuming nature or the questionable value of certain activities, the chief operator makes particular note of those.

Then she and her district traffic superintendent review the results of the analyses, to see what they reveal about the functions of the office and how they are being performed. (Sometimes they learn of ones that aren't being performed often enough or well enough.)

Such reviews are an eye-opening procedure. Here are the sort of things they are likely to disclose:

Duties which can be eliminated entirely or transferred out of the central office; and others which can be simplified.



Regular meetings of the management group enable them to program their time and co-ordinate their efforts.

Unrecognized opportunities for chief operators and assistant chiefs to delegate duties to others in the office.

Duplication in certain activities.

Need for additional management assistance, or for more clerical help.

Insufficient attention to certain management duties.

Recognition of situations such as these is one essential forward step toward remedying them.

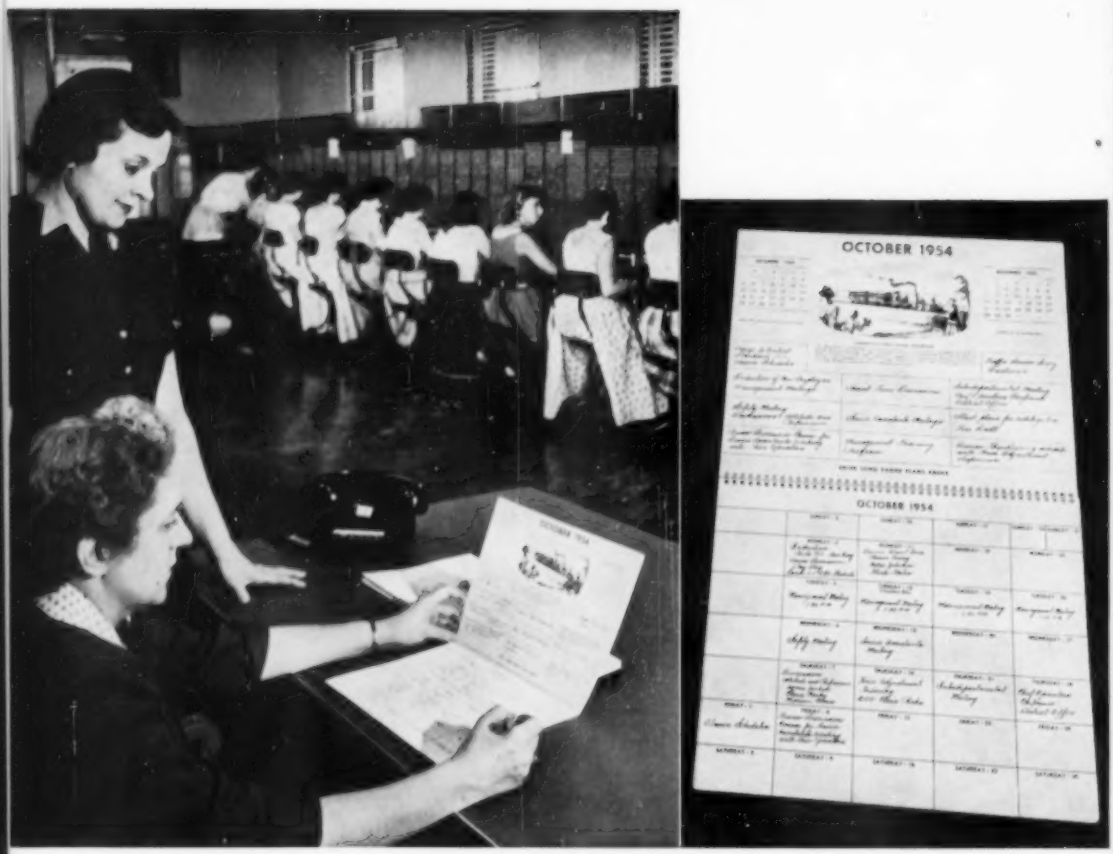
The Importance of Delegation

THE central office administration program provides a definite view-point regarding the nature of delegation. It recognizes the chief operator's responsibility for over-all results—but she shares it with her assistants. She discusses objectives and programs, problems and possible solutions —and she likewise shares her knowledge with them. She coordinates and integrates their efforts, and through them she welds the entire employee group into one with a common understanding and purpose—the giving of good telephone service. In the giving, the sharing, the working together, each derives personal satisfaction and pleasure.

It is recognized that a person in the responsible position of chief operator needs to be a good "delegator," so every effort is made to be sure that the subject is understood clearly and that any fears that cause a reluctance to delegate are uncovered and dispelled.

One chief operator said that she had wanted to give more responsibility and authority to her assistants but feared that she might be considered lazy or that she might not know the answers to all the questions directed to her. "So," she confessed, "I tried to keep my fingers in everything." Another chief operator who was

Assistant chief operators receive training from their chief in conducting effective discussions.



A chief operator finds that a "work organizer" in calendar form is a useful tool.

present remarked, "It probably is all right to keep our fingers in most things as long as we don't get our arms in up to the elbows."

Chief operators are urged to assign activities to their assistants, permitting them to share responsibility with them for the attainment of objectives and, as the keystone, to give to each assistant a well-defined and liberal amount of authority to enable her to act effectively.

When the chief operator delegates well to her assistants, they in turn delegate to service assistants, operators, and clerks full responsibility for their jobs because in a central office every person has an important part to play.

Each assistant chief operator has a portion of the force assigned to her for whose job satisfaction and work progress she is responsible. An organization chart posted in the operating room shows these assignments. Such groupings permit more frequent discussions by a management person with each employee than was possible when the chief operator tried to do most of this work personally.

These frequent discussions are beneficial in many ways. For example:

Mary is a young and attractive operator

—much too pretty to be labeled a problem. But she could easily have become a dissatisfied employee or a force loss, nonetheless. Mary had a choice of several jobs when she left high school, and selected telephone operating because it sounded interesting. The hours of work were explained to her carefully, but she brushed possible adjustments to working these hours aside until she faced the realities of working them. Then she was not sure that she wanted to be an operator.

However, an alert assistant chief operator spent time with Mary daily, making the work as interesting and challenging as possible, showing her how she could arrange to get a particular evening off, and encouraging her to persist until her seniority qualified her for early evening or day hours. Mary became an excellent employee, with every indication that one of these days she will be able to qualify for a higher level job.

Grace, on the other hand, is an experienced operator, one who does consistently satisfactory work and who is dependable in attendance and punctuality. She makes few requests of any sort, and is the kind for whom any office is truly grateful. But does she want to be appreciated silently? Certainly not. On one occasion she remarked wistfully, "The loneliest girl in the office is the one who goes along doing her best each day. Supervision does not seem to have much to say to her." Grace knows now that she is appreciated, and she is putting even greater effort into her work.

While the operator's chief contribution to good public relations is good telephone service given consistently and courteously, she has many opportunities to answer questions that her friends and acquaintances ask about the company and her job. It is a recognized management responsibility to provide opportunities for her to obtain desired information easily and promptly, and getting informal channels of communication established encourages such requests.

Ethel, an operator of about a year's service, met a neighbor who had a complaint about the company. He had been waiting for some time to get "regraded" from a party line to an individual line and he was certain that some of his friends had received faster service than he had. He remarked, "I wonder if you really have a good system for taking care of these requests?" Ethel did not know how the situation is handled, but she was certain of one thing and she said so emphatically: "I don't know what method is used but I am sure it is an honest one and our company would want you to feel satisfied. I'm going to find out more about this for you."

Ethel referred the discussion to her assistant chief operator, and was pleased at the prompt explanation she received. It made her feel important. Ethel was assured that the customer would be reached and a satisfactory explanation made to him also—one that would convince him of the company's fair and impartial treatment of customers.

Good delegation not only provides time for discussions with employees; it also is insurance that all parts of the job will receive merited attention.

Planning to Make Time

ALONG WITH clear-cut delegation goes careful planning: planning which enables each management person in the central office to make the most effective use of her time. And the regular daily duties and each day's unexpected happenings add up, between them, to consume the greater part of each

individual's time. It is the time *which is left* which can be planned for—can be devoted to activities perhaps formerly postponed or even not done at all!

To serve as a guide in all this, chief operators prepare long range programs, allowing time for all phases of the job, for a year ahead, and then from them plan their weekly and daily programs. Assistants usually plan in the same way, except that their long range programs cover shorter periods—about three months ahead.

The ability to develop practical work programs and carry through on them is another management skill and it ties in with the very important element of "time" which was mentioned earlier—time to devote to an activity, skill to perform it effectively.

When each assistant chief operator understands what her duties and responsibilities are and the extent of authority she has on each one, she is requested to make a self-analysis of her training needs. This she does by reviewing her list of duties and asking herself the question: "Am I confident of my ability to act effectively on each of these assignments?" She discusses with the chief operator each case where her answer is "No," and from this a plan for training is charted. Similarly, the chief operator reviews her personal training needs and discusses them with her district traffic superintendent.

One chief operator said: "When I heard that part of the program I said to myself, I'll do no such thing. After all, I have been a chief operator for 10 years and I should know all about the work." However, when she started reviewing the list of training needs of her assistants, she realized that in order to prepare herself to fulfill their needs, she, too, required more training.

The assistant C.O.s regard the invitation to list their training needs as a golden opportunity, and usually ask for more training than any one else would schedule for them. Sometimes they do not know precisely what specific training they need but they state their problems. It is in the field of non-technical skills that they have the most difficulty in expressing their needs.

One assistant chief operator said that she could work with an operator personally and usually get good results but she added: "I can't explain clearly how I do it and therefore I can't train some one else to do it." Of course what this assistant was asking for was a greater knowledge of how to work with people successfully: help in recognizing these skills and assistance in how to teach them to others.

In addition to training requirements expressed by each individual, the person to whom she reports suggests additional ones that seem to be needed. This is done carefully, because regardless of the value of a course, it is effective only when the individual feels a need for it and wants it.

The training needs as expressed or agreed to by each management person are entered on individual record sheets and are coded according to the urgency of fulfilling them.

Where Training Fits In

TRADITIONALLY, much of the training of central office management people has been given informally, on the job. Such training is practical, and yet because of its informality, individuals sometimes have been unaware of its worth and so lack confidence in it. It has been a common experience to have individuals request training that proved to be unnecessary. When this fact became obvious, an individual would explain, "I wasn't sure I was right because I picked up that information myself." An

An assistant chief operator discusses figurine painting with a group of operators enjoying this out-of-hours activity.

Attractive bulletin boards carry posters and notices in a central office.

Millinery classes are another favorite out-of-hours enterprise.

important part of management training is to build each individual's confidence in her knowledge and skills.

Timing of training is important, because if it can not be applied promptly and when needed, much of its effectiveness will be lost. In order to insure the success of off-the-job courses, the training is given by an individual's supervisor to the extent practicable, and followed through by her until the individual can apply her knowledge skillfully.

When persons other than the immediate supervisor conduct training courses, there is a well-coordinated plan of follow-up training conducted on the job. For example, learning how to administer the central office force schedules to provide that the right number of operators are always on duty is frequently given in an off-the-job course by a staff specialist who will have a group of individuals from several central offices. Then when each individual returns to her office she is given the opportunity to practice what she has learned, and the guidance she needs to become fully proficient in force administration is given by her immediate supervisor—in this case the chief operator.

Individuals have been encouraged to fulfill some of their training needs through a program of self-development. The giving of more responsibility and authority has stimulated the idea that it is each person's responsibility to participate actively in determining her training needs. Now, instead of waiting for the training to come to her she goes after it herself.

Just as it is one of the chief operator's major responsibilities to train her assistants, so is it the district traffic superintendent's responsibility to train his chief operators. It carries beyond getting the central office administration program established firmly. Good leadership, inspired leadership, needs continuing attention so that it will grow in effectiveness.

Valuable assistance is being given to district traffic superintendents and chief operators by traffic staff people. They are in a position to acquire broader knowledge and greater experience in the application of the program because of their wide range of contacts in the many offices they visit.

Experience meetings conducted by staff people and attended by district traffic superintendents and chief operators have become valuable aids in getting a pooling of good ideas and exchanges of practical experiences. These meetings keep enthusiasm and interest at high levels and result in continuing progress.

The central office administration program is effective both in improving central office operation and in developing each individual to her maximum capacity and at the same time helping her to derive the greatest satisfaction possible out of her work.

Preparing for the Future

BUT THAT is not all it accomplishes. It is helping to meet the challenge of future developments.

As the System moves forward in its program of customer toll dialing, it is going to mean the gradual elimination of the simple calls from one number to another.

This does not mean the elimination of the operator, for there is every indication that she will continue to be a most important element in our business. Her work will grow even more interesting and more challenging than it is today. It will be more important too, because fewer personal contacts with customers will make it essential

that every contact leave impressions of good service and courteous treatment.

This progress calls for an ever-improving leadership in the supervisory group in each central office. It emphasizes the importance of selecting well qualified candidates for promotion, and the need for adequate training in leadership skills.

The central office administration program has become a framework into which present and future central office activities can be fitted in an orderly manner. It is the tool which has been needed to make the chief operator the service executive she really is, enabling her to give adequate attention to all phases of management, so that her office will be as outstanding in the less tangible personnel aspects of the job as it is in the technical ones.

There is every indication that the problems of the future will be met adequately. Today's chief operators are resolved that tomorrow's chiefs shall be as good as and maybe even better than they are.

This spirit is typified by a chief operator who was being complimented for the efficiency, poise, and initiative displayed by her assistants. Her reply was: "I'll be retiring before many years, and I can think of no more fitting way of showing my devotion to the service and my appreciation for the satisfaction I've derived from my job than to leave well-trained leaders to carry on the traditions of good service."

ONE OF THE BELL SYSTEM'S four outdoor test plots for timber products was closed down recently after the completion of 25 years of telephone pole "life tests." The one-acre plot, located at Limon, Colorado, was used by Bell Laboratories timber products engineers to determine the best methods of wood preservation for lodgepole pine and western red cedar, two types of poles economically practical in the Western states.

As a result of the tests at Limon, the best wood preservative was found to be creosote or pentachlorophenol-petroleum. Also tested were greensalt, and several inorganic salts, including various mercury and copper compounds.

Forty-three of the 405 ten-foot pole lengths from Limon have been shipped to Murray Hill where they are now being cut, shredded, and analyzed to determine how much of the wood preservative has been retained in the 25 years. By determining the extent of evaporation at Limon, the serviceable life of the properly treated pole can be accurately predicted.

Training methods and devices developed in Baltimore by school administrator and telephone man gain recognition from secondary school teachers throughout the nation

NEW TELEPHONE PROGRAM AIDS HIGH SCHOOLS

E. DUNCAN HYDE

Supervisor of Business Education, DEPARTMENT OF EDUCATION, CITY OF BALTIMORE; and

CHAUNCEY R. TATUM

Commercial Supervisor, Public Relations, THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY OF BALTIMORE CITY

MARY MARSHALL WAS EMBARRASSED—chagrined, even. It was her first day in her new job, and she had failed to handle a normal situation properly. It was a tremendous disappointment for a young high school graduate. The cause of her downfall had not been her shorthand or typing, in which she had been so thoroughly drilled in school, but—of all things—a telephone. It had rung in her boss's absence, and she had attempted to answer it—only to discover that what looked so simple, so self-evident, had her stumped.

The experience of Mary Marshall, fortunately, has not been repeated for many graduates of the business departments of the Baltimore City public schools since the members of the class of 1950 received their diplomas. Today, not only the graduates of the public high school business courses in Baltimore City, but also those of thirteen county systems and girls in a number of local parochial high schools in Maryland, receive realistic training in office use of the telephone with "live" telephones. In addition, other teachers are borrowing the "telephone kit" for use in illustrating applications in their own areas of teaching; e.g., vocational counselors train students in making telephone appointments for job interviews. One county school system has extended use of the material to its core curriculum, where all students may benefit from the training.

In essence, a practical, down-to-earth application of good public relations techniques to typical business telephone conversations in the fields of banking, retailing, insurance, transportation, and secretarial work is demonstrated by fellow stu-

An office practice class in business use of the telephone.

dents to entire classes by means of a portable classroom amplifier unit. The demonstration unit and teaching material were developed over a period of several years by the present writers, with considerable help from teachers in the high schools.

The Baltimore course, as revised in December, 1951, served as the background for a similar unit developed for Cleveland schools in 1953. Now, as a consequence of a flood of requests from business teachers all over the nation, the A.T.&T.Co. is preparing a teaching unit, including teacher's manual, student booklet, case material, telephone amplifier unit, and other audio-visual materials. This unit will be available to all Bell System companies before the end of the 1954–55 school year.

Employers Complained "Graduates Can't Use the Telephone"

THAT THERE HAD BEEN other Mary Marshalls among the graduates of Baltimore City high schools was well known to one of the writers. He had observed them as teacher and supervisor; but it was in the latter capacity that he was made more fully aware of the situation when the supervisor of guidance and placement reported a summary of business-men's criticisms of most recent graduates.

Responses to follow-up questionnaires, by employers who had hired graduates through the placement bureau of the Baltimore City schools, listed the perennial complaints: inability to spell and punctuate, weakness in arithmetic, and *little or no knowledge of how to use the telephone.*

While improvement in spelling and arithmetic is a problem of teachers of these subjects, beginning in the intermediate grades, and instruction in the language arts encompasses oral communications, teaching the use of the telephone is chiefly the concern of business teachers in the high schools—for it is their students who are being prepared primarily for business life.

Business education may be defined as that phase of education dealing directly with the relationships, attitudes, skills, and knowledges necessary to the student for his understanding and adjustment as he prepares to function in that great economic and social institution, *business*.

To provide training that will enable students to enter initial positions successfully, the courses taught in today's high schools are both practical and factual. Because of the extent of the telephone's use as a communication medium, it is only logical that telephone usage is included in many phases of this instruction. The importance of including information about the telephone has long been recognized by business education textbook writers, most of whom have been classroom teachers. Space devoted to the subject varies from ten to as many as fifty-five pages in the texts available for Office Practice, Secretarial Practice, General Business, and Consumer Education courses. Information on the telephone and its use is found also in the texts for the Distributive Education courses of advertising, retailing, and salesmanship.

Converting textbook material to training that is practical, meaningful, and realistic to students is a major problem of good teaching. In an attempt to do this, a few teachers had managed to provide some make-shift telephone arrangements. One had acquired an old private push-button intercommunicating system with six stations, much like those used in offices of yesteryear, on which he "listened in" while students carried on typical office conversations. Another had bought two war-surplus sound-powered telephones with his own money, and still another had hooked

Practice in case methods brings confidence to telephone novices.

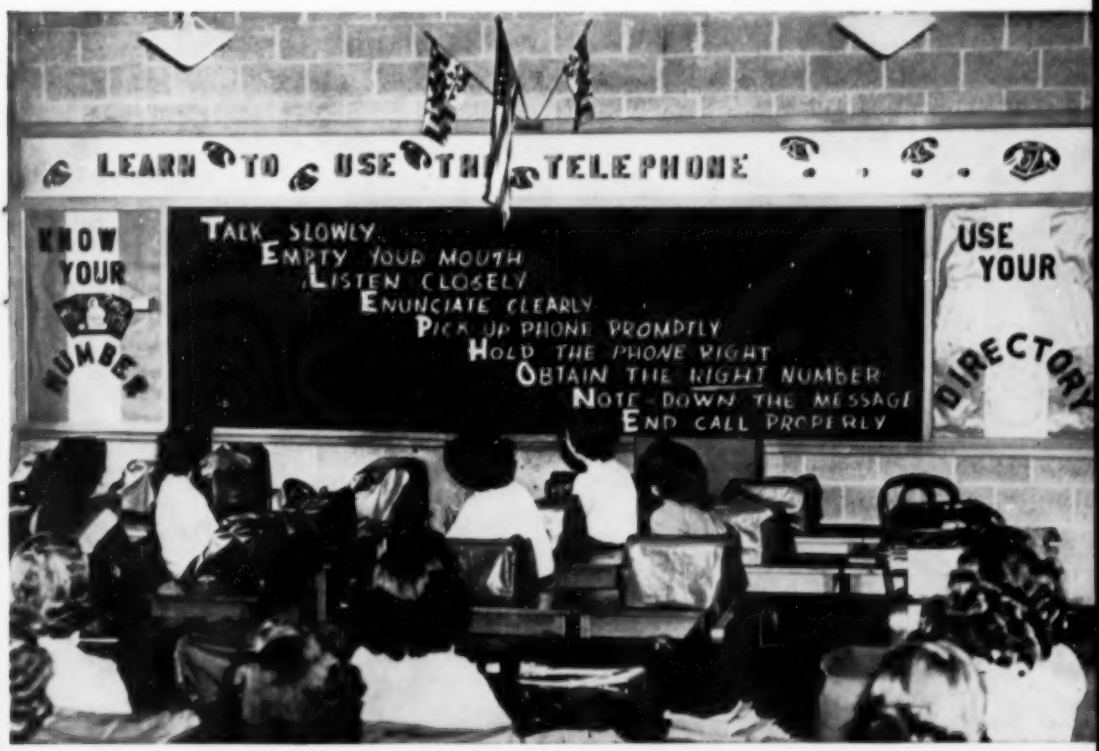
up a surplus telephone with a loudspeaker on the end so that the class could share in what was being said. By and large, however, the individual teacher had no real means of putting the telephone story across. Such was the situation when Baltimore's supervisor of business education asked the telephone company for help—on the theory that the company that supplied the service should know best how to do the job.

The assignment of developing a program for the schools was given to a member of the Chesapeake and Potomac Telephone Company's customer relations staff. For many years the company had been giving advice to business telephone users in the form of printed booklets and folders. These were considered, along with several films produced by the Bell System, to be the story of good telephone manners. Armed with these materials, the company customer relations man first met with a committee of teachers who had already made some progress toward a single course in telephone instruction rather than teaching parts of it in several instructional areas.

Initial Training Materials Prove Inadequate

THE FIRST TEACHING MATERIALS included two non-working telephones for every school, four telephone directories, a teacher's manual, a student booklet, and suggestions for the use of the film "Telephone Courtesy." These were delivered to the schools in January, 1950. Used as near the end of the school year as possible, so that students going to work would have the training fresh in their minds, these aids seemed to offer a tangible means of doing a better teaching job.

Handiwork of a student bulletin board committee.



In the Spring of 1951, when the unit was scheduled for its second year of use, the telephone representative started a round of visits to the high schools, talking with teachers and students individually. It became apparent that there were lacks in the training material. For those who came from homes where there was telephone service and who were familiar with the "feel" and use of the telephone, it was possible to put on a demonstration conversation with the two inoperative telephones. But for the others (from 10% to 60% were dependent on the school for instruction)* it was like learning to start a plastic model outboard motor that couldn't run—or perhaps like learning the process of milking with a wooden cow.

In some schools, students from homes without telephones would not coöperate, and even where students acted well in using the non-working telephones, they acquired the bad habit of talking too loudly. They were raising their voices so that all students in the classroom could hear.

Many youngsters naturally rebel against rules. Only when they can observe or experience the consequences are they willing to accept and apply guiding rules that others have found necessary to life. Many pupils considered telephone training "just more of the same stuff—rules, rules, rules." Others were sure they wouldn't need it in their future jobs.

A careful analysis of the situation disclosed that the basic difficulty lay in the approach which had been used. Quite logically, all training material in techniques, manners, and courtesy had been designed by telephone companies for existing telephone subscribers: people who had telephones. Authors desiring to include telephone training material in their new texts had gone to local telephone offices for information. The booklets which they received, and subsequently incorporated in one form or another in their texts, were quite naturally prepared for and aimed at people with telephones.

The Program is Improved

TO MEET THE SCHOOL SITUATION a new approach was required, incorporating the following:

1. Live telephones, over which pupils could experience the feel and use of the service in two-way conversations.
2. An attention-getting and class-sharing medium—the loud speaker. This would allow designated students to carry on telephone conversations and simultaneously promote participation by the remainder of the class.
3. Textual material of typical and factual conversations, indicating how the telephone is used to communicate information and ideas in business. The conversations were shown in two forms: indifferently—so that students could observe the inadequacy of the method and pick out the errors; interestedly—demonstrating good techniques and the application of public relations principles to telephone contacts. In addition, the interests of the teachers of office and secretarial practice, distributive education, economics, etc., were kept in mind, so there would be cases for each field of instruction:

   retail stores—customer calls, orders, complaints;

   merchandising—suggestive selling and selling by telephone;

* December, 1953, statistics show 65% of the families in Baltimore City with telehone service. However, in some neighborhoods 95% of the families may have service, while in another area the percentage may be as low as 40, with larger families in the non-service group. School populations reflect this wide spread as far as previous telephone experience is concerned.

secretarial and office practice—duties of private secretaries, a proper preparation of memoranda of telephone calls;

consumer education and general business—insurance, banking, travel, shipping, etc., proper and effective use of the telephone directory.

There were many trials and tribulations to designing a portable, combination live telephone circuit and amplifying system, which was suggested to the mind of the telephone man in part by the experiments of a teacher at Baltimore City College and in part by his own personal hobby of high-fidelity music reproduction. The authors owe a debt of gratitude to several employees in the Plant and General Engineering Departments of the local telephone company for their help in developing the portable unit.

With the addition of twenty-two case studies of appropriate telephone calls, the Teacher's Manual grew in size to 172 pages (typed). In addition, copies of all cases were reproduced, without the teacher's informative notes, for the use of students and enclosed in a supplementary envelope.

A test of the new teaching material was made with a small group of new employees of the Chesapeake and Potomac Telephone Company of Baltimore City. On the basis of this experience, typical time schedules for the course were set up for teachers' guidance. A sample follows:

1st (Hour) Day	—Introduction: Student Booklet, Part I
2nd Day	—Film, "Telephone Courtesy"
3rd Day	—Student Booklet, Parts II and III
4th to 8th Days	—Processing of selected cases (Average 2 cases per teaching hour)
9th Day	—Directory Lesson
10th Day	—Film, "Thanks for Listening"

How the Improved Program Was Introduced to Teachers

To INTRODUCE the expanded material to the teachers in the business education courses of the school system, a workshop meeting was held for all business teachers and others interested on January 16, 1952. The course was outlined, set-up and use of the amplifier kit was explained, and several of the cases were demonstrated for the teachers. Telephone business office employees took the parts of participating students, and the teachers evaluated the case material as students, the telephone company representative acting as teacher. This procedure has been followed as additional school systems have adopted the program, except that a tape recording of a class in session has been substituted for the presentations by local business office people.

Equipment: telephone amplifying kit and teaching materials, as developed in Baltimore.

The telephone representative personally delivered the initial supply of materials and the kit to each high school. In most instances, department heads called in their teachers to practice setting up the kit, and to afford them an opportunity to clear up questions which had developed in their minds since the meeting.

Teacher and Student Evaluations Confirm Effectiveness

BEFORE THE END of the semester, visits to classrooms showed clearly that here was a better answer to the problem of teaching good telephone habits in the schools. Most teachers were doing an effective job in their presentations. The enthusiastic participation of students in the case demonstrations and their easy and quick acquisition of the importance of warm and friendly attitudes in building better public relations in their telephone contacts were especially rewarding. They vied with one another to participate, and were quick to note any deviation on the part of the participants from what was intended.

The teachers' evaluations, which were requested, confirmed the classroom observations.

According to Teacher A: "The unit extended over twelve class periods . . . The students enjoyed participating in the presentation of the case studies. The variety of situations gives an insight into the types of telephone calls they may be expected to handle. From their apparent enjoyment in both participating and listening to the cases, I feel this is a definitely stimulating device. In addition, they gained information and benefited from the cases in other ways.

"On the basis of student evaluation, the unit was a success. Ninety-five per cent of the students expressed the idea that it should be taught to all high school pupils. They stated that they were able to detect their faults and correct them, thereby helping them gain a greater appreciation of 'good telephone manners and telephone personality.'"

Teacher B offered these comments: "A hearty recommendation can be given. For the charges of other Sisters, it would not only teach the proper use of the telephone but also expose the children to good manners in practice, correct phrasing of requests, good social relations, and, in addition, present to them fields of vocational endeavor in which they may wish to engage."

Post-class reaction is considered by some educators as an effective means of evaluating student receptiveness; therefore pupil appraisal of both subject matter and teaching is being given increasing attention. There were some interesting student reactions to the new telephone unit when teachers asked students to turn in comments, unsigned.

Student A submitted the following comment: "I liked the unit because it helped me greatly in my usage of the telephone. I especially liked the conversations held by fellow students over the phone, and then to criticize and discuss them. The time spent on the lessons was just right in my opinion, but I think we could have more conversations. This unit helped me in my usage of speech over the phone, way of answering the phone, and how to take orders."

According to Student B: "It helped me to be more courteous towards people on and off the telephone. It helped me develop a willingness to answer the phone. I became more friendly toward people over the phone. It teaches correct man-

ners. It assures one confidence in answering and talking over the telephone."

Student C's evaluation emphasized somewhat different points: "I learned a great deal from our real conversation on telephones. I am sure that I learned more this way than I would have learned from a book. The experience was also very interesting. This unit also gave me the opportunity to study the directory. The trip to the telephone office was worth while in many senses."

New Case Material Appears to Meet Business Educators' Requirements

EDUCATORS POINT OUT that all learnings are referred to as primary, associate, or concomitant. The *primary* learning consists of the facts, principles, theories, etc., that are the main core of the lesson. The *associate* learning consists of the facts and other more objective materials that are learned because they are related to the primary and are logically brought into the lesson. The *concomitants* consist of the attitudes, ideals, and appreciations that the student acquires because of his classroom experience. Good teaching contemplates taking full advantage of all three learning phases.

In its preliminary report,* a Conference on Basic Business Education, held in the United States Office of Education in 1950, recommended among other things to:

> "Validate and revise the content of the instructional and learning units in basic business education . . . by obtain-

* "Basic Business Education for Everyday Living," Monograph 74. South-Western Publishing Co. January 1951.

New kit, known as the Teletrainer, recently developed by Bell Laboratories in coöperation with the Commercial division of A. T. & T. Company's Department of Operation and Engineering.

ing additional data relating to business activities, business mistakes, and business problems of youths and adults . . ."

The writers believe the intent of the objectives and recommendations of the Conference on Basic Business Education, as well as a full share of associate and concomitant learnings, can be achieved from the case material used in the telephone training unit. In fact, so much of the material in the cases affords the teacher opportunities to develop relationships with every-day living that in many ways the telephone conversation seems only a means of accomplishment; yet at the same time ideals of good public relations and telephone manners are being acquired. For example, among the instructional materials will be found:

—Two cases, one on refrigerator repair and another on auto parts, showing use of the number coding system followed by manufacturers to keep track of replacement parts.

—One dealing with reporting of an automobile accident to an insurance company incorporates the provisions of the State Law with regard to filing accident reports with the State Motor Vehicles Department.

—An inquiry to a railroad regarding a shipment explains the method of changing a bill of lading from "Prepaid" to "Collect."

—A lesson covering the use of the telephone directories is built completely on the basis of everyday living. Use of this principle enables teachers to make what could be a dull and uninteresting project one that is full of interest and fascination. Some typical problems for students to solve are:

1. You wish to hire a new clerk for your office. List at least three telephone numbers you could call to have applicants sent to you.
2. Your cashier has brought you a $10 bill that looks "phoney." Whom would you call about it and what is the telephone number?
3. You have been studying to be an electrician and wish to obtain a state license. What telephone number would you call to get information concerning the date of the next examination?

Visual Materials are Important Teaching Aids

SECOND ONLY TO MOTIVATION is the need for materials for teaching. At best, textbooks are student guides, and the teacher must ever bear in mind that many students do not learn easily from books. Other sources, such as the daily newspaper, the classroom bulletin board, films, and others, play an important part in the process of teaching. It was for this reason that teachers asked the telephone representative for posters and bulletin board materials. Fortunately, a series of posters designed originally to aid business concerns conducting in-service training programs to improve the telephone manners of their employees was available and seemed equally applicable to the classroom situation. A set of these posters, fourteen in all, is now given to each teacher along with the other telephone unit materials.

There are many methods for their use in the classroom. One teacher puts up a new poster each day as the course progresses; the telephone training session begins with the class reading in unison the messages on the posters in the order in which they were put up. In some school systems, as in nearby Baltimore County, much emphasis is placed on the activities of student bulletin board committees.

The Teletrainer being used for individual coaching.

That the telephone unit would play a part in the emotional adjustment of a student never occurred to the authors. But in one school there was a sixteen-year-old girl, new in the neighborhood, who appeared uncomfortable, unadjusted, and unhappy. Pleasant enough in manner, Sally was sufficiently overweight and unattractive to merit no notice from the boys. She did not excel in any classroom work and participated only grudgingly in class social activities. When the telephone unit came along, she was assigned one of the parts in a case. She had the best telephone voice of any pupil in the class, and by the end of the week Sally was the star of the group on the telephone. Several days later, when the school secretary was ill, the office-practice teacher recommended Sally to the principal as the girl to answer the telephone and take care of the office. This series of events changed not only the attitude of the other students toward the girl but also her attitude toward them and her classroom work as well. The staff psychologist said, "It was this series of events that brought her out of her emotional shell and caused her to forsake her former defense mechanism of 'negativism'."

Extension of Program to Rural Schools Culminates in Nationwide Demand

SINCE THE TEACHING MATERIALS described were prepared initially at the request of a large city school system, they contained much that related to business activities as they would be found in a metropolitan center. The program had been in use only a very short time in the Spring of 1952 when the superintendent of schools in one of the distant Maryland counties asked to have it for his business department.

With some doubt that it might not have the same appeal to the boys and girls in a predominantly rural area, the telephone representative launched the program at a meeting of both business teachers and school principals from each of the four

high schools in Worcester County. A schedule was established whereby the kit was to be shared among the four schools. With the teachers' reports of success, there was less doubt of its effectiveness when the unit was requested by other school systems serving rural and semi-rural areas.

Rural-area teachers point out that where a case or two on farm problems would offer better motivation for those boys who plan to stay on the farm, many of their graduates go to the larger towns and cities to seek employment. In contrast to the friendly familiarity of small-town business people, they observe that it is good for their pupils to learn more of the formal attitudes to be found in business contacts in big cities.

Of special interest is the fact that several school systems are not limiting the use of the unit to business education groups but are finding it worth while for all students.

In every instance, the program has been established on a school system basis, although, in almost every case, the initial request came from an individual teacher. Establishment on this basis was considered the best assurance that administrators approved its adoption, that the program could be inaugurated with a general workshop meeting, that the assignment of the kit could be made by the school system, and that the accumulation of reports of use could be administered by the school board office. However, each teacher is given his own teaching and visual materials. Films are distributed through the local telephone manager except in those school systems having an audio-visual library which can handle assignment and distribution.

THE AUTHORS wanted to be sure that their new program was sound and had been sufficiently well tested by teachers and pupils before making a formal report of its effectiveness. However, from the beginning, educators in nearby states have been seeking information about it. It was the subject of discussion at an area teachers' meeting in Virginia in the summer of 1952; served as background for a similar program inaugurated in Cleveland in 1953; was tested in a Pennsylvania school classroom in the Fall of 1952; and was reviewed, with approval, by several faculty members in the business education departments at the Pennsylvania State University and the University of Maryland. It was used with a college class in the latter institution in March, 1954. Most recently, the teaching material has been incorporated in the curriculum of the training school for new bank employees operated by the Baltimore Chapter of the American Institute of Banking.

It seems as apparent to teachers as it is to businessmen, most of whom cannot afford or do not have induction and indoctrination training programs, that the telephone is just as important a production tool in office procedure as the adding machine, typewriter, and duplicator; and thus its use should be taught to those being prepared for the business world.

Many automotive vehicles combine specially designed labor-aiding equipment with their primary function of transporting telephone craftsmen to and from assignments

MAINTAINING AN EFFICIENT AUTOMOTIVE FLEET

FREDERICK K. GLYNN

Automotive Engineer, PLANT SECTION, O. & E. DEPARTMENT, A. T. & T. CO.

A PARADOX OF THE Bell System's automotive fleet is that its thousands of trucks and cars are most profitable when the miles are fewest. To say it another way: practically every mile its motor vehicles travel represents a total loss.

That may sound odd—but it makes sense.

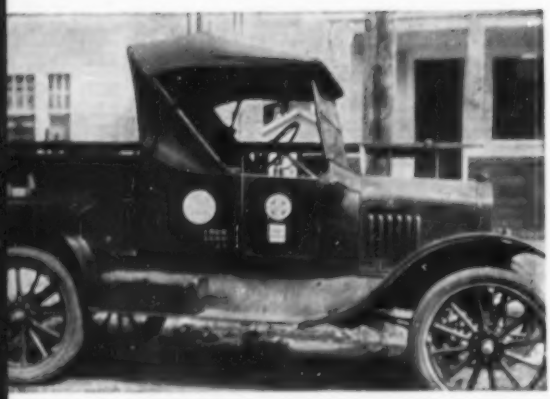
For the System's passenger cars carry the supervisors to their installers, splicers, line-gangs, and other craftsmen on location in the field. Quality to a great extent, and certainly quantity, of helpful supervision is dependent upon supervisors' time spent with the craftsmen and not in miles travelled.

By the same token, the many different trucks serve their craftsmen drivers best when standing at the job.

The System goes to great pains to limit these motor vehicle miles; or, to express it another way, to minimize the loss of craftsmen's time between job locations. In the big cities, with their downtown traffic congestion and high degree of concentration of telephones, installers' supplies lockers are located strategically in office buildings. Each of these lockers serves more telephone installers and repairmen than would several small trucks. The variety of the supplies in the lockers is practically identical with the supplies carried on a truck. Only the quantity differs.

Other methods of diminishing the vehicle miles include the plan of having supervisors ride with craftsmen when on-the-job training requires longer time periods than regular supervision. Again, the location of garages near the center of working areas requires more garages, but each garage is correspondingly smaller in size. The saving in travel time to the job is, of course, the pay-off in economy.

In 1924, in Model T days of 30 years ago, an installer drove his small truck about 8,300 miles in a year, while today he drives about 7,600 miles. The Model T was good for 40 miles per hour—down hill—while today's small truck could go 70 and take most hills in stride. The hours spent in driving then and now probably range from 375 to 425 in a year. Speed is probably no different, because then as now the Bell



Model T—the installer's truck of three decades and more ago.

System was super-conscious of safety. Today the streets and roads where installers work are so congested with traffic that less than Model T speeds are the fastest safely possible.

The trucks for the installers, repairmen, combination men and other craftsmen who usually work alone are the smallest in the telephone fleet. They are the so-called half-ton trucks. The truck chassis and cabs used are strictly commercial products. In this respect, however, desirable production-line options—heavier springs, larger diameter clutches, heavy-duty tires, etc.—may be specified, to better adapt the chassis to the telephone job and to combine the longest life with lowest operating expense.

Telephone truck bodies are practically all of special design, not only for telephone installation but for each job up through the heaviest line construction. These bodies are in reality mobile storerooms and tool rooms. Every regularly needed material, supply, and tool, in requisite quantity, has its stated place in the body. It was such standardization which enabled the hundreds of men rushed to New England last month—as described elsewhere in this issue—to pitch in at once at tasks they understood, working readily with familiar trucks and tools.

Pictured on page 193 are the small general utility and rural body truck, the somewhat more elaborately compartmented installation truck, and the larger utility truck for general work not requiring a winch and pole derrick.

Plumbers, electricians, and other vocations use fitted truck bodies. The unusual feature of telephone trucks is the provision of labor-aiding machinery driven by the truck engine.

To "sidewalk superintendents," telephone construction trucks are the most spectacular. The winches, pole derricks, pole-hole borers, and other labor-aiding tools are a source of never-ending interest even to telephone people.

Trucks of Many Sizes

THE CONSTRUCTION TRUCKS range from the two-man-crew trucks through to the large crew trucks. Illustrated on page 194 are three sizes of construction trucks. Some of the trucks have all four wheels driven, so that they can negotiate fields and other roadless terrain where the lines and cables follow the crow's flight. These trucks can go almost anywhere that a self respecting mule will go. All are equipped with winches and pole derricks of Bell System design, and many with pole-hole diggers which can dig a pole hole almost as quickly as a crew could break the sod with a hand shovel.

The pictures of the light and medium-size construction trucks show the pilot or experimental first working models of a new Bell System design of hydraulic-powered pole derricks and the hydraulic pole-hole digger. These are seemingly "push-button" machines. For whereas it takes a construction crew about 20 minutes to

Modern installer's truck with its complement of telephone tools, materials, and supplies.

The utility body below offers many options in the arrangement of lockers, bins, and drawers.

The cable line maintenance truck, with ladder platform, permits safe and easy maintenance of aerial cable.

Three methods of handling telephone poles efficiently. Above is a light construction truck equipped with hydraulic pole derrick. The medium size construction truck at the left carries a derrick and pole hole digger which fold back over the body when not in use. The truck below enables its crew to bore a hole and set a pole in less than 10 minutes.

erect the three-legged pole derrick, and further appreciable time to rig the derrick-suspended digger, the new hydraulic equipment erects itself from its carrying position on top of the truck in about a minute and a half, ready to dig the hole and erect the pole.

To be entirely truthful, it isn't push-buttons: it's short levers which open valves to admit oil under tremendous pressure to the rams of the derrick and motors of the digger. The oil is put under pressure by a pump which is driven from a power take-off on the transmission of the truck engine. Safety of operation is improved, for the hydraulic derrick can be moved up or down at infinitesimal speed by just cracking the valves, and the digger needs no lineman close to it when digging.

When digging gets extensive or rugged, there is a Bell-System-designed earth borer truck to do the job. These trucks mount a big auger driven by the truck engine, and provide limited general construction facilities in the truck body. The borer shaft does double duty as a pole derrick. A winch completes the complement of labor-aiding equipment.

Safety the First Consideration

SAFETY PROTECTION of the telephone craftsman is the first consideration in the design of each telephone truck, its body, and equipment. A general safety observance is to place, insofar as possible, all commonly used tools, supplies, and materials so as to be accessible from the curb side or rear. The road side of a motor vehicle is known as the sui-side.

The comfort protection of telephone craftsmen is cared for by the commercial standard cabs, selected, when options in design are available, to best meet telephone requirements. The forward portion of the medium and large construction trucks is partitioned into a comfortable crew compartment with windows and curb-side door. There is a waterproof bellows between the back of the cab and the front of the crew compartment so that by permanently removing the cab's rear window and providing a corresponding opening in the crew compartment, the travel arrangements approach those of a sedan.

To complete the picture of trucks in telephone work:—materials and supplies are distributed from warehouses and storerooms to the garages and locker locations in all sizes of delivery trucks from small panel trucks to tractor-trailer vans. Other craftsmen are served with materials on the job by step-in trucks fitted with shelves, bins, drawers, and racks, to hold a standard load to meet the needs of the number of craftsmen served during the day. Others include trucks used in public telephone work, in repeater station maintenance, and in point-to-point radio maintenance. These latter trucks may some day require very interesting design and development work, for "point-to-point" stations are no respectors of ease of access. If it's the highest point of land at the proper distance from the next stations, that is where the little house with the high mast is placed. And television as it develops may require appreciable numbers of program pick-up trucks. Time will tell.

Years ago, when linemen manhandled much aerial plant into place, the construction truck chassis had considerable capacity available for carrying reels of cable and other heavy supplies in the body of the truck. Today this free load capacity is limited by the weight of the labor-aiding machinery. It no longer is always practicable to load cable into the truck body, so cable reel trailers have been designed.

Manhandling a telephone pole into place, in years gone by, was neither easy nor efficient.

Poles never could be moved without trailing, but the present-day trailers are a far different design from the one shown in the picture of the gang piking a pole into place.

Other standard trailers, Bell System designed, include combination pole and cable reel trailers, pole and general utility trailers with platform body, emergency mobile radio trailers having a fully enclosed body, and splicers' small trailers compartmented like a splicer's truck body.

These motor vehicles and trailers are so common to telephone operations that even telephone people often forget how indispensable they are. They also fail to realize the amount of design, selection, daily servicing, maintenance, repair, and supervision which produces and makes available safe vehicles for the day-to-day telephone jobs.

The designing of truck bodies, associated equipment, and trailers is done by a group of automotive engineers in the American Telephone and Telegraph Company. It is their work to anticipate the needs of the field forces for new equipment and to continually improve existing designs to meet changing field conditions.

A Coöperative Undertaking

Selection is a coöperative undertaking between the automotive industry, the A. T. & T. engineers, and the Operating Companies. The A. T. & T. engineers work out the physical requirements for a truck chassis which will handle a telephone job, scan the specifications of various makes of chassis, confer with the manufacturers' engineers on the strength and ability of component parts, and agree on proper specifications. In the small half-ton class, perhaps six different manufacturers can furnish satisfactory chassis. If so, all six are listed for the final selection and decision in the Operating Companies.

In addition to coöperation in the selection of chassis, the A. T. & T. engineers investigate and evaluate the materials and supplies necessary to the operation and maintenance of the vehicles—such as tires, gasoline, lubricating oil, paint, accessories of all kinds and description, service equipment, and the like. When study of a prod-

uct indicates favorable results can be obtained by its use, it is brought to the attention of the motor vehicle people in the Operating Companies for their consideration. If enough of the Companies adopt the product, purchasing savings are realized through the considerable volume required by the size of the System fleet.

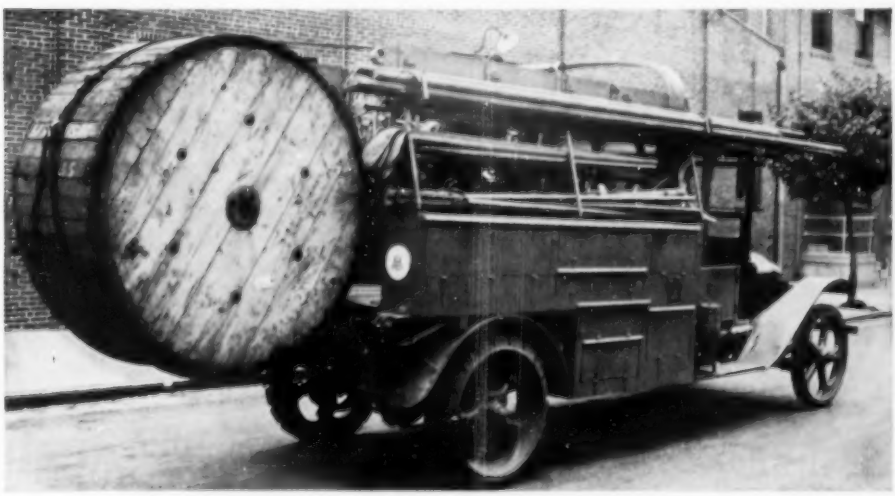
When a truck body, a winch, a derrick, a pole hole borer, or other item has been designed or a chassis adapted or a product selected, it is the further job of the A. T. & T. automotive engineers to write a Bell System Practice providing full information covering safe and efficient operation and use.

The A. T. & T. automotive engineers have a pride of accomplishment in their work. The Armed Forces have time and again adopted Bell System truck body designs for the use of their signal and communications groups, and many of the design features of the trucks used by other utilities are adapted from System designs. Another fact spurring the A. T. & T. engineers is the absence of pressure in any way on an Operating Company to adopt the automotive practices, designs, developments, adaptations, products, materials or supplies suggested. The A. T. & T. work must be of such value that the operating people in the telephone companies will accept it of their own accord.

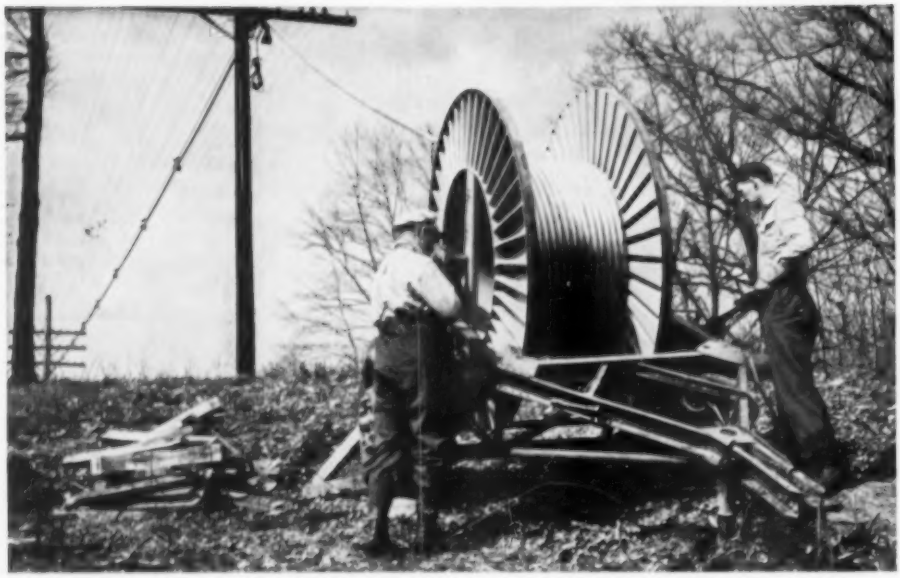
The A. T. & T. automotive work could be summarized as consisting of effort which can be done once at one location instead of being done by each of the telephone companies individually.

At this point the ball is passed to the Operating Companies. Their motor vehicle people are on the firing line. Living with the job, they are more familiar with the local problems. It is their responsibility to secure the new vehicles, the needed materials and supplies, and to maintain the vehicles in safe and efficient operating condition.

The motor vehicle organization in an Operating Company is part of the Plant Department. It is headed by a supervisor



This solid-tired truck of 30 years ago would carry a reel of cable in the body.



Today's trailer carries the reel of cable to the job and then supports it while it is being paid out. With a few rearrangements it will double as a pole trailer.

of motor vehicles, assisted by a staff and in some companies by division supervisors. Reporting to the staff or division people are garage foremen, inspector-repairmen, mechanics, and garagemen. The organization in the companies will differ with the amount of daily servicing and repair work done by the garage forces and the amount purchased from service stations and commercial repair shops.

The supervisors of motor vehicles and their immediate assistants are in a rather unique job. They must have a good working knowledge of all phases of the telephone business. Every department uses motor vehicles. They must also have extensive knowledge of the automotive industry. Their every-day job includes economics, engineering, physics, chemistry, electronics (recently added), accounting, local, state and federal laws and regulations; safety, and a very liberal amount of straight thinking common sense. We think it's the most diversified job in the telephone business.

In all telephone companies, the responsibility for safe mechanical up-keep of the vehicles rests with the Plant Department, but the responsibility for the daily use and for safe and efficient operation rests in the craftsman driver and his craft supervision. The coöperation between the motor vehicle forces and the using groups is very close, as it must be to secure the greatest dividends from the use of the vehicles at the least possible motor vehicle cost.

Safety for the drivers and of the motor vehicle people in these day-to-day operations is stressed. Gasoline tanks and pumps are placed in the garage yards, vehicle lifts are provided, safe tools are available,

and all personnel are trained in the safe way to do the work.

The day-to-day servicing work of the motor vehicle people consists of gassing, oiling, greasing, filling radiators and batteries and tires, washing, cleaning and polishing, touch-up of paint, and making tinkering adjustments (as distinct from repairing).

One feature of the day-to-day job warrants special attention. It is the tinkering adjustments made on the vehicles. Other names for tinkering adjustments are "tune-up" and "preventive maintenance." This work of carburetor adjusting, fan belt tightening, spark plug cleaning, brake adjusting, and a dozen other short tinkering jobs keeps each vehicle safe and satisfactory to drive and importantly defers the day when more substantial repairs are necessary.

In the matter of repairs the craftsman driver has a key part. Except for periodic mechanical and visual inspection by the motor vehicle people, the driver is the only one who knows when the motor, clutch, brakes, battery, and other parts, need attention. To secure this knowledge in an orderly way, each driver is responsible for preparing a "Driver's Daily Trouble Report," more commonly called the "Gripe Sheet" if there is anything wrong with the vehicle. The motor vehicle people act on these reports each night. If the trouble can not be corrected before the week-end, the driver is advised of the situation. If the trouble involves safety in any way, the vehicle is removed from service until corrections can be made. No driver in the Bell System need ever use an unsafe vehicle. As a daily safety precaution, each driver is expected to check his lights, horn, windshield wiper, and brakes as he leaves the garage.

Bell System Esprit-de-Corps

IN ALL OF THE preventive maintenance and repair work on automotive equipment there is an esprit-de-corps throughout the entire Bell System. All troubles encountered which prove to be chronic or repetitive are reported by the telephone company supervisors of motor vehicles to the Automotive Group of the A. T. & T. Co. These reports, if safety is involved, result in immediate notification to all telephone companies. In all cases the A. T. & T. engineers study the trouble with the manufacturer's engineers to evolve a cure. The remedy may be greater frequency in servicing, addition of a strengthening brace, or redesign of a part. Whatever the findings, all telephone companies are advised in the next issue of an A. T. & T. periodic publication called "The Motor Vehicle Service Letter." This procedure welds the Bell System fleet into one big proving ground, resulting in substantial savings in motor vehicle costs and—more important—very definitely decreasing accidents due to mechanical failure of a vehicle.

Five hundred million miles: sixty-five thousand motor vehicles: thousands of trailers: the largest commercial fleet in the world: *it serves best when standing still.*

HEADQUARTERS SUMMARY

June 15 to
Sept. 15, 1954

THE BELL TELEPHONE COMPANIES have again earned the National Safety Council's highest award, the Award of Honor for 1953. This award, which has been received for the third consecutive year, is based upon improvements in both the frequency and severity of accidents during 1953 as compared with the average of the Bell Companies and the communications industry during the previous three years.

IMPROVED METHODS now make it feasible to splice and cut-in terminals on practically all non-working aerial, block, house, and buried distribution cable as a one-man instead of a two-man operation. Introduced over a period of time, the improvements which facilitate one-man operation include: An extension ladder seat, and an arrangment for fastening the ladder to the aerial cable, so as to provide a comfortable and secure working position for the splicer; a small tent which can be handled by one man; an acetylene torch for aerial cable sheath work; and mechanical splice and terminal closures. The most recent—and a major —aid is the Murphy cable tester, which enables one man to quickly identify the cable pairs to be worked.

TESTS of an automatic protection switching system installed on the Denver-Sacramento radio relay system indicate very satisfactory operation. This protection system is arranged to substitute a protection channel for any one of up to five regular broad band channels at times when transmission may be interrupted or impaired by equipment trouble or fading. The system utilizes fast-acting switches at both ends of a section of route 150 to 300 miles long, interconnected by suitable wire or radio circuits for transmission of the necessary control signals to perform the switching operation. The maximum time required for a switch in a typical switching section is about .03 second. The new protection system will be used on all major TD–2 routes, and on such routes will replace the protection system now in use. The system now in general use on radio relay routes provides protection on an automatic switch basis only where a protection channel is assigned to a particular working channel.

A NEW TELEPHONE incorporating a distant-talking microphone and loudspeaker, in addition to the conventional hand set, is in limited producton. The microphone is incorporated in the base of a 500-type set, together with a volume control for the loudspeaker and two buttons for providing the equivalent of switch-hook operation when the set is used for distant talking purposes. The loudspeaker, occupying a space about 3 x 4 inches, is located in a separate plastic housing.

The instrument may be used in the normal manner, if desired, since a regular hand set is included. However, the hand set remains in the cradle when the distant talking feature is in use. It is possible to switch from conventional to distant talking use (or vice versa) during a conversation as privacy or other considerations may dictate. This new telephone is expected to find a wide field of use in business and industrial applications generally, as well as in residences. In addition to freeing the hands during conversation, it permits a group of people to participate in a telephone conversation.

ON AUGUST 18, the A. T. & T. Company directors announced a new nonconvertible issue of $250,000,000 Thirty Year Debentures due September 15, 1984, to be sold through competitive bidding. Bids were subsequently received from two groups of investment bankers at headquarters on September 21. The winning bid of $101.9199 for 3¼ per cent debentures was made by a group of 277 investment firms headed by the First Boston Corporation and Halsey, Stuart and Company. This bid represented an interest cost to the Company of approximately 3.15 per cent to maturity of the issue. The losing bid, which was made by the second group of 120 investment bankers headed by Morgan Stanley & Co., was $101.87, likewise for 3¼ per cent debentures. This issue, which was the largest ever sold through competitive bidding, was offered to the public at $102.52 to yield 3.12 per cent and met with quick investment demand. So far in 1954, Bell System Companies have sold a total of $350,000,000 debentures through competitive bidding.

A NEW Employees' Stock Plan offer was voted by A. T. & T. directors on September 15, 1954, with essentially the same provisions as in the previous offering in 1952. About one-half of the 3,000,000 shares authorized for issue under the Plan by share owners in 1950 remain

to be offered now. The purchase price will be $20 per share less than the market price when payment is completed, but not more than $150 nor less than $100 per share. The company plans to send employees a prospectus describing the new offer in October. They will have until December 15 to make their purchase election.

Employees with three months or more of service on October 10 may elect to purchase one share of stock for each full $500 of their annual basic rate of pay on that date, but not more than a total of 50 shares including any shares purchased or being paid for under the 1952 offer. No A. T. & T. officer will be eligible. If employee elections exceed the total shares available under the Plan the company will allot fewer shares than specified in purchase elections. Purchasers will pay at the rate of $5 per share per month by payroll allotments beginning in February 1955 and to be completed not later than July 1957.

About 650,000 Bell System employees will be eligible to participate. Installment payments currently being made by some 210,000 employees under the 1952 offer will be completed not later than February next year.

PLANS for an underwater telephone cable linking the United States and Alaska were announced by the Long Lines Department in mid-July, in order to provide expanded and speedier communications for both public and defense purposes. The proposed addition, which will have a capacity of 36 message circuits and cost an estimated $14,000,000, is expected to be completed late in 1956.

Two deep-sea submarine cables, to be laid several miles apart, one for northbound transmission and the other for southbound, will stretch 800 nautical miles between Port Angeles, Wash., and Ketchikan, Alaska. The new system will be similar in design to the underwater cable to be constructed across the north Atlantic, and will have specially designed built-in repeaters spaced about every forty miles. A sixty-five mile radio relay system will be constructed between Seattle and Port Angeles, while at the other end the cable will connect with facilities of the Alaska Communication System, a branch of the U. S. Army Signal Corps, which now furnishes service to that territory. The Alaska organization plans to build a second segment of submarine cable northward from Ketchikan along the inland waterway to Skagway.

BELL SYSTEM overseas and ship-to-shore telephone service has continued to expand all during 1954. Service between the United States and East Germany has been resumed for the first time since World War II; Goa, the Portuguese colony in India, has been linked; and connection has been established with Singapore and British Malaya. In addition, high seas service has been made available to the Greek liner "Olympia," the Swedish liner "Patricia," the Italian liner "Cristoforo Colombo," and the Atlantic and Caribbean cruise ships "Seven Seas" and "Silver Star."

FOUR BELL SYSTEM ORGANIZATIONS—Long Lines, the Southwestern Bell, the Northwestern Bell and the Illinois Bell Companies—have acquired the private communication facilities of the Great Lakes Pipe Line Company. The first two Bell System organizations are now providing full period telephone and teletypewriter service linking 50 pumping stations and terminals over 1,600 miles of the pipe line company's routes, which extend from Oklahoma as far north as Grand Forks, N. D., and include Minneapolis and Chicago as well. During the summer, the pipe line company also accepted a proposal that Long Lines and Southwestern Bell provide mobile service, to be integrated with their other services.

GAS PRESSURE has long been used in long distance cables, and the resulting improved maintenance made it desirable to extend pressurization to the exchange-cable plant. Since older types of cable terminals are not gastight, gas dams, or "plugs," must be constructed in terminal stub cables to maintain gas pressure. The hot-asphalt plugs used on long distance cables are too expensive and time-consuming to be used in the large numbers required by the exchange cable plant. Therefore, Bell Laboratories has developed a new cold-resin plug that is less expensive and is easier and faster to construct.

WESTERN ELECTRIC has announced delivery to the U. S. Signal Corps of a new type of multi-channel military radio relay system which can link points 25 to 30 miles apart by radio and be used in combination to extend hundreds of miles. Similar in principle to the Bell System's microwave relay links, the new equipment is a complete communications system packaged in convenient cases for ready mobility and designed to operate continuously under all types of climatic conditions.

The Blue Pencil

THE UNIMAGINABLE WIND and the abnormally high tide combined to produce waves which wrought havoc along much of the southern New England coast. Vessels of every size were borne far inland and wrecked. Wharves were pounded apart and seaside structures were moved from their foundations or demolished. As the hurricane moved inland its destructive fury vented itself on fine old trees, on houses, barns, and other buildings, on crops and roads and whatever was vulnerable to its unexampled power. But there was no damage to telephone plant.

For there was no telephone. It wouldn't be invented for another sixty years.

It was the hurricane of September 23, 1815, we were referring to: "the great September gale." It was the first storm of such magnitude about which there is much recorded information.

Nearly 200 years before, one had taken a passing wallop at the Pilgrim Fathers—but there was little in the way of man-made structures for it to blow down. In 1788 came another over much the same area. And six years after the 1815 hurricane came a blow which hit New Jersey and Long Island, and crossed over to New England with decreasing force. In New York City it caused more damage in two hours than was ever before experienced.

In the next 117 years there were four more recorded hurricanes, of somewhat erratic behavior and varying degrees of force and damage. That brings us up to 1938 and the famous storm of that year. In loss of life and in damage of every sort it still stands without equal.

A count establishes that, including the four in the last 16 years, there have now been a dozen such ruthless visitations, all told, and leads to the conclusion that a hurricane "track" actually does exist, running up the eastern seaboard, across Long Island and eastern Connecticut and Rhode Island, and into the rest of New England and beyond. The two which came this Fall seem to bear out this notion as they proceeded to take life, to destroy property, to upset people and confuse their way of living.

Words cannot tell much about what a hurricane does, what it is like where a hurricane has passed. We, who followed closely in the path of the 1938 and 1944 hurricanes and wrote about them, have left to pictures and a summary the reporting of "Carol" and "Edna"and the telephone damage they caused and the fine story of restoration.

Calling these storms by names whose alphabetical sequence indicates the numerical order of their origin somewhere East of the Caribbean may be a handy way of keeping track of them, but the names seem trite, and inept with reference to such brute destructive force. "Carol"? "Edna"? Why not "Caesar" and "Eagle"? Those suggest power, at least. And it would not be surprising if the telephone men who had to repair the damage those two coy females did to outside plant had still other names for them.

WHEN EAST CHICAGO TRAFFIC people selected one of their operators as Miss Voice, one of the guests at the ceremony was the East Chicago superintendent of schools. So favorably impressed was he with The Voice with a Smile that he later devoted a column in the school paper to the *Influence of a Smile*. From it we quote:

"The fairly large group of finalists were people—not less nor more beautiful than people generally, not shorter, nor taller; not better nor less fashionably dressed. There was something about them, though, that was noticeably different from people generally—they had radiant countenances . . .

"Those countenances were the reflected evidence of a studied effort to attain a cultivated, expressive, pleasant, and a not necessarily quiet but a quieting and calming voice that radiated good will and a zest to do the best for anyone who heard it.

"The particular quality so highly possessed by these operators, unquestionably, was the product of training that benefited them, but even better was a benefit to the community. What an influence for good in a community is the 'voice with a smile' . . . !

"For pleasant voices and pleasant counte-

nances are contagious . . . Who can do or say mean things, or resist the better impulses all of us have, when greeted by a community of 'voices with smiles'?"

AMERICANS are appreciative of good telephone service and all the elements which contribute to it, and we in the industry are accustomed to seeing letters of thanks from customers, sometimes for special services rendered and at others simply voicing general gratitude and good will. Apparently the custom may be carried abroad, along with the national desire for ice water and ham and eggs. The following item appeared in a recent issue of the British *Post Office Magazine*—the British Post Office handling the telephone and telegraph services as well as the mail:

"An American in Britain has given full credit to the transatlantic telephone service. When he recently spoke from London to his sister in Staten Island, New York, he was impressed by the courtesy and efficiency of the operators, by the speed with which he was connected, and because he and his sister could hear one another so clearly. In a letter to the Post Office he comments that 'It is rare, in these days of paying much for little, to receive such value for the expenditure of a relatively small sum.' "

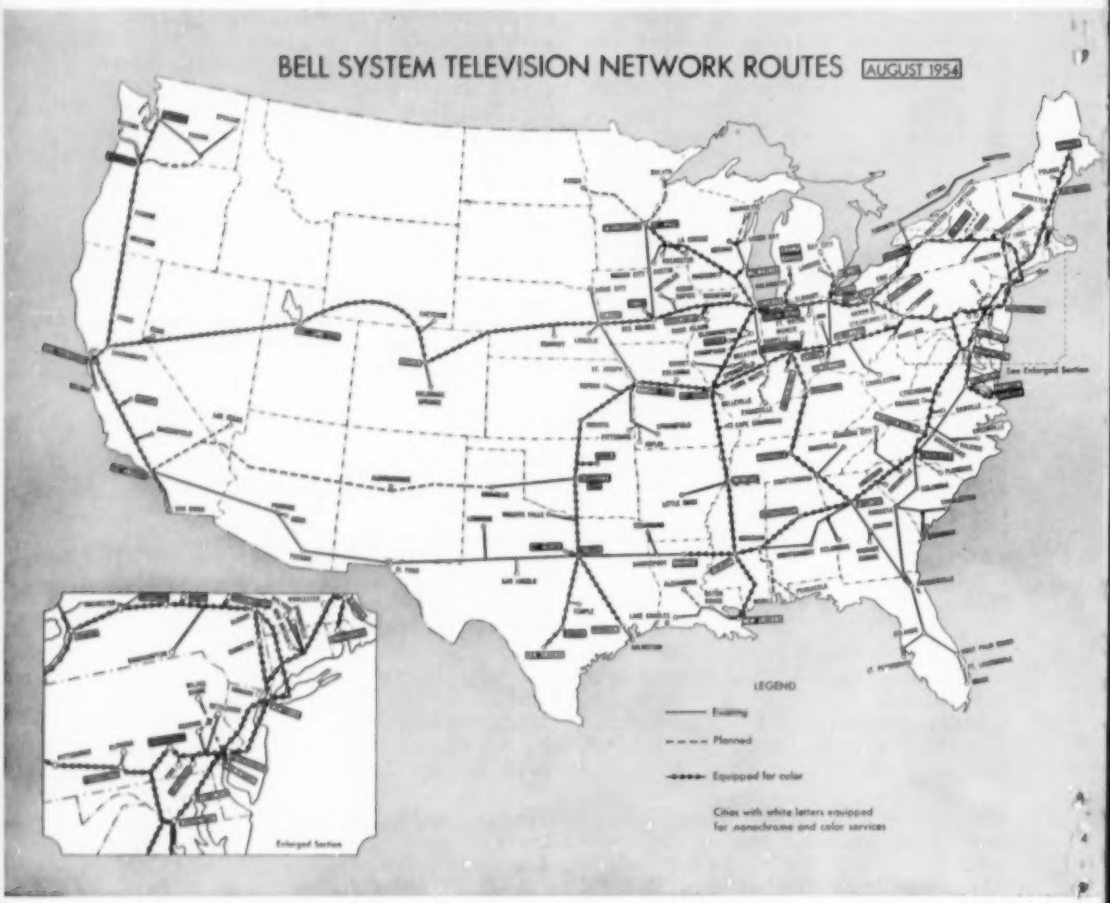
SO MUCH that is important and impressive comes out of the Bell Telephone Laboratories that it is interesting—if a mite disillusioning—to find that some of the most spectacular of the equipment there has now been used to shatter one of childhood's cherished fancies. And with all scientific decorum, too. For Prof. Maurice Ewing, director of the Lamont Geophysical Laboratories at Columbia University, brought a conch shell into the free space room of the Labs, where the nearest thing to absolute silence may be established, to find out whether the "ocean wave" sound usually heard when one of these shells is held to the ear is a "reflection" of other noise or does exist within the shell. When the doors closed upon soundlessness, there was no sound to be heard within the shell. The conch is but a sound amplifier! Not many youngsters have access to the noiselessness of the Laboratories' special room, however, and so they will continue to hear with wonder and delight the gentle roar of the waves in the shell even after it has been brought away from the beach.

FOR HIS COVER ETCHING, "ACCOUNTING OPERATIONS: People and Diversified Equipment," Carl M. Schultheiss had to cheat a bit. Accounting operations and machines are grouped separately, and in no accounting office would so many types of activity take place in so restricted an area. After visiting several accounting offices, therefore, and making preliminary sketches, Mr. Schultheiss depicted his subjects in the representatives and harmonious composition which graces our Autumn cover.

Mr. Schultheiss was born in Nuremberg, Bavaria, and received his early training in the School for Arts and Crafts there and in the Royal Academy in Munich. He lived for a time in England before coming here, and is now a citizen of the United States. He has worked in various media of the graphic arts: color prints, painting, book illustration and design, as well as with the burin and needle. He is a member of the National Academy of Design, of the Society of American Graphic Artists—president 1948-50—and of other associations in the field. Examples of his work hang in galleries and museums in many countries, and among the awards he has received are—to mention but a few—two first prizes from the Library of Congress, two from the National Academy, and gold medals from the Pennsylvania Academy and the Carnegie Institute.

As was the case with the etchings by Mr. Gorsline and Mr. Castellon, a reproduction of Mr. Schultheiss' "Accounting Operations" will be sent without charge to anyone who writes to ask the editor for it.

WE SEEM to have backed into the art business a bit—quite unintentionally. When we received a request—in addition to those for etchings—for copies of the colorful paintings of Alexander Graham Bell and Theodore N. Vail which were published in our last (Summer) issue, we scurried around and found some which had not been printed on the back, and could be framed just as they appeared in this MAGAZINE. Our correspondent thought they would look nice in business offices. So, "while they last" we shall be glad to send copies of those too on request.



Work continues on transforming the Bell System television network so that these facilities will transmit color as well as black and white programs. By the end of September more than 100 television stations in some 75 cities could receive color programs over the Bell System network.

A LIVING MEMORIAL

The cottage at 3425 Lincoln Street in Portland, Oregon, is shaded by graceful trees and covered with ivy. Drive out Lincoln Street and you're sure to admire the tall column of ivy that rises, as if by magic, in front of the house.

Many years ago the owners—A. H. Feldman and his wife—remodeled the house to fit their dreams . . . and set out slips of ivy around it. And when their son, Danny, came along, he too liked to plant things and watch them grow. One day, when he was only nine years old, he took a handful of ivy slips and planted them at the base of the telephone pole that stood in front of the house.

Time passed . . . and the ivy took root and grew, climbing slowly to the top of the pole. Like the ivy, Danny grew too. He finished high school, went to college. The war came along before he finished —and Danny joined the Army. In time, he went overseas with the Tenth Mountain Division—as a ski trooper. And, like so many others of his generation, he gave his life for his country.

Not very long ago the overhead telephone lines were removed from the poles on Lincoln Street. The ivy-covered telephone pole in front of the Feldman home was about to be taken down. Its work was done. But when the telephone crew arrived, Mrs. Feldman came out to meet them. "Couldn't it be left standing?", she asked. And then she told them about her son. The foreman listened to the tender story, studied the pole for a moment, and then turned to Mrs. Feldman. "I'll do my best," he promised. At least the pole wouldn't be touched that day.

And, as it turned out, it wasn't touched at all. At the request of the telephone company, the Portland City Council passed a special ordinance permitting the company to leave the telephone pole standing. And it's there today, mantled in ivy, a living memorial to Sergeant Danny Feldman—who once was a little boy who loved green and growing things.

Telephone story heard on the
Telephone Hour radio program

PRINTED IN U.S.A.